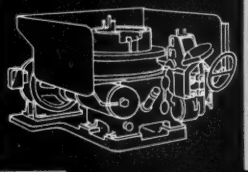
WIRE AND WIRE PRODUCTS

MAY 1950

Progress
YEAR AFTER YEAR

in wire drawing
• speed
• safety and
• dependability

MOTOBLOC



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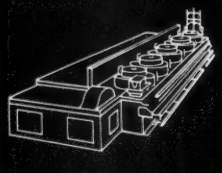

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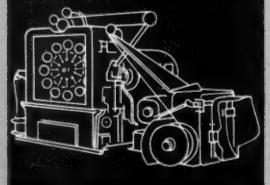


Vaughn WIRE DRAWING MACHINERY

THE VAUGHN MACHINERY CO.
Cuyahoga Falls, Ohio, U. S. A.

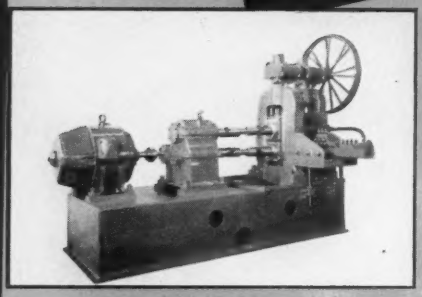
COMPLETE COLD DRAWING EQUIPMENT—Continuous or Single Hole...for the Largest Bars and Tubes...for the Smallest Wire...Ferrous, Non-Ferrous Materials or their Alloys.

Vaughn, Motoblox, Motobloc—Reg. U. S. Pat. Off.

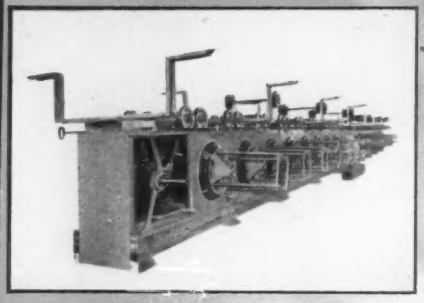
OFFICIAL PUBLICATION OF THE WIRE ASSOCIATION

LOOK TO Wean FOR WIRE MACHINERY

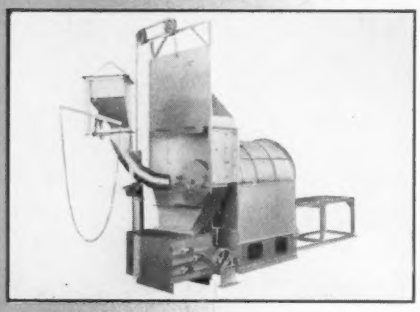
Process OR *Product*



2—Hi Wire Flattening Mill



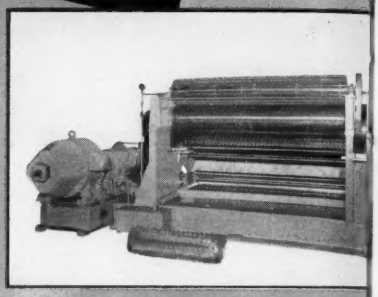
Wire Galvanizing Take-Up Frame



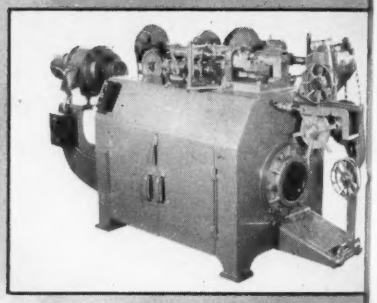
Nail Galvanizing Unit

In the past few years tremendous progress has been experienced in the field of wire machinery. Production speeds have been tripled and quadrupled. Product quality has been greatly improved. Machines have been made easier to operate and maintain.

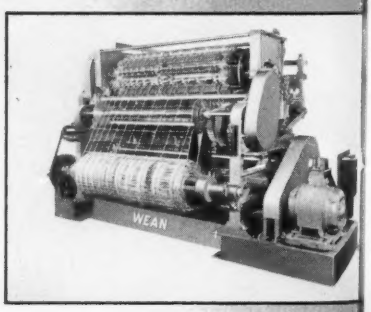
The Wean Equipment Corporation has been a large contributor to this advancement. Wean wire mill specialists have designed, built, and installed wire mill equipment for the leading wire producers the world over. If you make wire you should look to Wean for the best in machinery, service, and facilities.



Hexagon Netting Machine



2 or 4—Point Barbed Wire Machine



Hinge — Joint Fence Machine

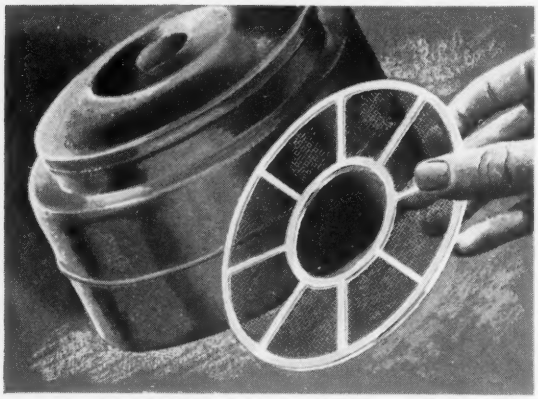
NARROW STRIP MACHINERY

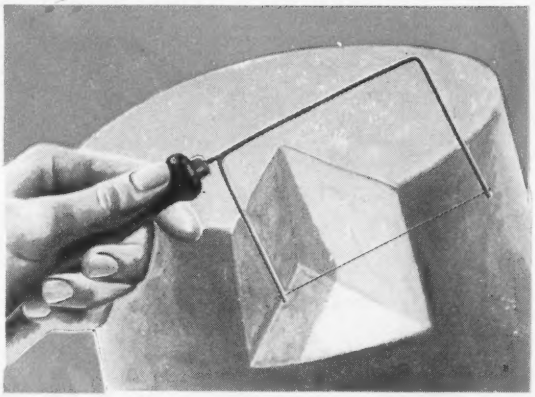
(FOR 36" WIDTHS OR NARROWER)

Wean Equipment Corporation

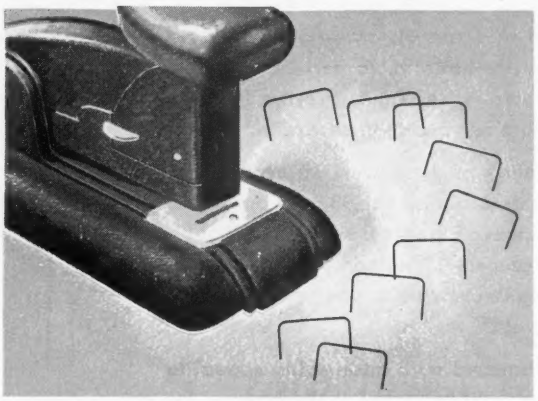
CLEVELAND, OHIO

use U·S·S Amerfine





. . . for products like these



THESE drawings point out just a few of the many possible applications of U·S·S Amerfine. For this versatile wire is tailored for use in every product that requires fine wire.

For engine air filters . . . brooms . . . brushes . . . staples . . . vegetable strainers . . . butter cutters, you'll find U·S·S Amerfine ideal.

We will draw Amerfine to fit your needs exactly. And we can supply it NOW in the mill quantities you need.

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

If you use fine wire . . . use Amerfine

USS

UNITED STATES STEEL

ITS PURE ZINC ARMOR

locks out corrosion... permits severe forming

New users of bethanized wire are always amazed by our ability to make its coating so uniform, so perfectly bonded all the way around the steel wire. These are the features that account for its stubborn resistance to corrosion.

Equally important for many of its uses is the exceptional coating ductility made possible by the 99.9-pct-pure zinc. It's deposited atom by atom on the steel wire in our highly-developed electrolytic process. Whether you bend bethanized wire, twist it, wrap it, or draw it, you won't see any zinc cracking or peeling off.

The smooth luster of bethanized wire adds sales appeal to your products. And its versatility makes it the answer for many jobs never before attempted with zinc-coated wire.

Whether you need hard- or soft-temper wire, standard, heavy, or extra-heavy zinc coatings, we suggest you get complete details from the nearest Bethlehem sales office.

SOME TYPICAL USES OF BETHANIZED WIRE:

Coil springs
Telephone wire — Barbed wire
Solid clothes line
Twisted wire brushes — Coat hangers
Wheel spokes
Cotter pins — Chain-link fence
Core for aluminum conductor (A.C.S.R.)
Pail bails — Paper clips
Helical springs
Bottle crate dividers
Conveyor belt fabrics — Wire rope
Fine wire items
Pump chain — Baskets
Snow fence — Bookbinding

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
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★ Bethanized Wire ★

BETHLEHEM STEEL

WIRE & WIRE PRODUCTS, Vol. 25, No. 5, May, 1950. Publication Office, at One Sherman Ave., Jersey City 7, N. J. Executive Office 300 Main Street, Stamford, Conn. Published monthly by the Quinn-Brown Publishing Corp., Richard E. Brown, President; R. S. Spengel, Secy. and Treas. Subscription price: U. S. $5.00; Canada, $5.00 per year; 50 cents per copy; Foreign, $7.50 per year. Entered as second class matter, January 10, 1949, at the Post Office, Jersey City, N. J., under Act of March 3, 1879.

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. . . *and often saves in metal costs*

These zipper teeth take a whopping bite out of production costs. By switching to Alcoa Aluminum Wire, some zipper manufacturers save up to 50% of their metal costs. Many report that aluminum's lasting lustre adds sales appeal, too.

The making and selling of your wire goods might also be improved by switching to Alcoa Wire. Forming is easy on your present equipment. Finishing you can eliminate altogether. And you add the extra sales appeal of aluminum's long life.

For complete information, call your local Alcoa sales office.
Or write: ALUMINUM COMPANY OF AMERICA, 1950E
Gulf Building, Pittsburgh 19, Pennsylvania.

ALCOA FIRST IN ALUMINUM

ALCOA ALUMINUM

INGOT • SHEET & PLATE • SHAPES, ROLLED & EXTRUDED • WIRE • ROD • BAR • TUBING • PIPE • SAND, DIE & PERMANENT MOLD CASTINGS • FORGINGS • IMPACT EXTRUSIONS
ELECTRICAL CONDUCTORS • SCREW MACHINE PRODUCTS • FABRICATED PRODUCTS • FASTENERS • FOIL • ALUMINUM PIGMENTS • MAGNESIUM PRODUCTS

LOWER DIE COST ! ! !

We now offer semi-finished Carbide Dies at rough-drilled die prices as follows:

Properly encased premium grades of Carbide.

Concentricity assured as bearing and all angles are lapped to within .001" to .002" of the finished die specifications.

Eliminate costly ripping and loss of hole sizes to reduce your own die shop burden, thus permitting better care and maintenance of your dies.

Lower your inventory to a useful range of hole sizes.

You can now purchase EXACTLY what you need in grade, shape and size.

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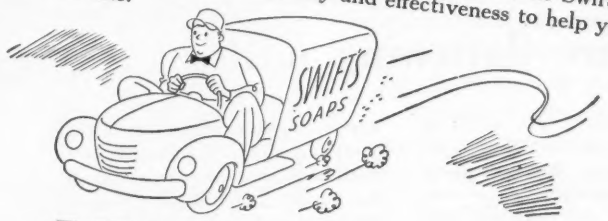
We're READY with quality soaps for every wire drawing need! You can always find the right soap for the job in Swift's complete line. Whatever your specialized need, Swift's Soap Department can fill it. And you'll find that Swift's Soaps for wire drawing uses have efficient lubrication, minimum dusting and dependable uniform quality. You can't buy finer soaps anywhere.

WILLING to continue Swift's research laboratory activities to develop better products for your purpose! Our technical division is constantly working on wire drawing problems. This means that Swift Soap products always have the quality and effectiveness to help you get better results.



And ABLE to give fast service from Swift distribution points coast to coast! You can order any of the fine soaps listed below and expect immediate delivery. Remember—use good soap and enough of it! Good soap promotes economy for you . . . better products for your customers. *Powdered White Ribbon* • *Guaranteed Powder* *Snap Heavy Duty Wire Drawing Powder No. 282* *No. 559 Powdered Soap*

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See your local Telephone Directory for address of your nearest Swift & Company office.

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Cut Production time 50% by swaging cables

SWAGING MOVIE AVAILABLE

Shows how swaging permits improved grain structure, tensile strength, elasticity. This 16 mm., 26-minute sound motion picture available free on request. Write us direct.

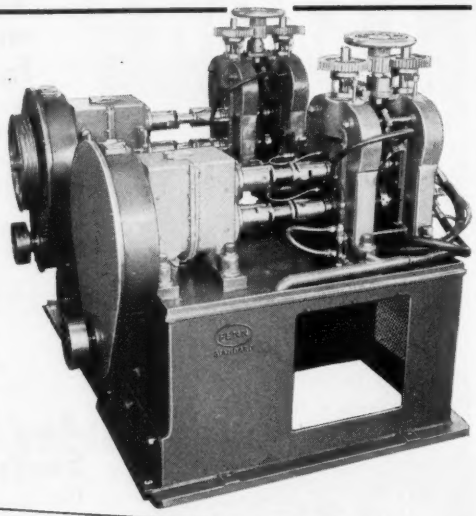
No more need to waste valuable production time by soldering or splicing cables to fittings! Performance records show an actual saving of 50% when these old style methods are replaced by swaging.

Fenn-Standard Rotary Swagers can be used for attaching almost any shank, ball, or barrel type fitting to wire cable. Swaging saves material, saves labor—does not require skilled operators. What's more, swaging improves the physical characteristics of the metal itself. It cold flows the metal of the terminal into the interstices of the strand or cable on which it is swaged. This makes the swaged fitting stronger than the cable itself!

Prominent users of Fenn-Standard Rotary Swagers include aircraft manufacturers, repair depots, elevator and hoist equipment manufacturers. The automotive industry, too, finds cable swaging the efficient answer for attaching brake, cowl and seat cables.

For complete information on Fenn-Standard Rotary Swagers see your nearest Fenn dealer or write us direct.

Cut costs, increase output with Fenn-Standard wire flattening mills



Flatten wire in one pass at 50 to 2000 feet per minute! With Fenn-Standard Tandem Wire Flattening mills, you can handle ferrous or non-ferrous alloys and stainless steel rapidly to close tolerances. Cut costs substantially below equivalent work done on single stands. Save on handling, use fewer operators.

These well known mills provide the most efficient wire flattening method known. Modern design, careful engineering, generous dimensions of parts and close tolerances account for their performance. Require minimum maintenance over a long service life. Available in tandem units up to 5 on a single stand or base with roll diameters from 3.5" to 12" to cover the entire range of wire sizes.

Fenn-Standard Machines Are Sold By:

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FENN-STANDARD MACHINERY

FENN

Shaping metal for better and stronger products at lower cost

Quality that saves money...that's why

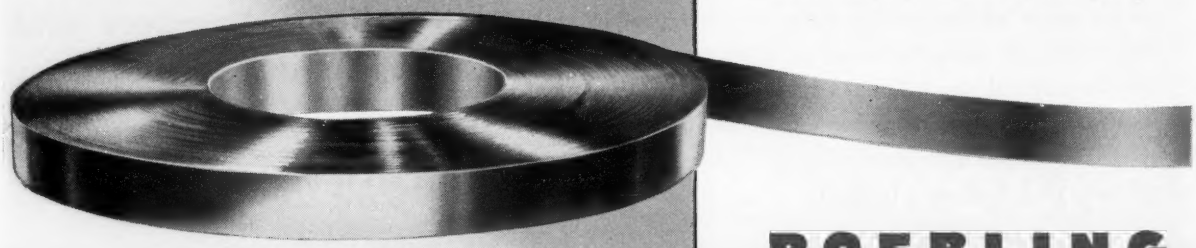
Today it's Roebling!

for Cold Rolled Spring Steel

JUST PUT IT on one basis . . . *dollars and cents!* If you cut down preparation time, you save money. If you cut down machine stoppages and rejects, you save still more. And you'll make *all* these savings with Roebling Cold Rolled Spring Steel because it's dimensionally accurate . . . absolutely uniform in physical properties and structure . . . one inch just like every other inch.

Roebling Cold Rolled Spring Steel is available annealed, hard rolled untempered; scaleless tempered; tempered and polished; tempered, polished and strawed, or tempered, polished and blued.

Have your Roebling Field Man help you select the cold rolled spring steel—or the round, flat or shaped wire—that will help improve both your product and your production, and give you genuine economy. John A. Roebling's Sons Company, Trenton 2, New Jersey.



Roebling has one of the largest specialty wire mills in America. Special techniques and the most modern precision machines assure a product that brings you faster, smoother operation.

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Wire shapes shown are greatly enlarged.

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Your product, too, may have one or more parts which could be made better and more economically from Continental's shaped wire. Or, you may be able to add extra sales appeal with decorative Continental wire for smarter, lower-cost trim. Most manufacturers today are looking for ways to reduce product costs while improving the competitive appeal of things they make and sell. At Continental you will find engineers who are ready and eager to work with you to solve your "shape-engineering" problems. If you want service with the wire you buy, call on Continental. Wire or write us at Kokomo, Indiana.

Standard and Special Shaped—and Regular Round Wire in Many Alloys, Tempers and Finishes Continental wire is made in standard and special shapes in a great variety of sizes, tempers, alloys and finishes. Write today for your free copy of Continental's handy booklet of wire information for manufacturers.

*Tr. Mrk. Reg. U. S. Pat. Off.

CONTINENTAL STEEL

CONTINENTAL STEEL CORPORATION

GENERAL OFFICES • KOKOMO, INDIANA

PRODUCERS OF *Manufacturer's Wire* in many sizes, shapes, tempers and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, Lead Coated, and special wire. ALSO, Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

XLN

a new magnet wire enamel

REVOLUTIONARY!

in all 3 ways

1. Needs no dies
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ENGINEERS OF FINE FINISHES SINCE 1870

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Here are the Performance Properties of VITRON

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- dimensionally stable
- excellent electrical properties in minimum space
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Will these qualities improve your product? If so, we'd like to help you profit from them.

New Low-Twist Vitron

300 GLASS YARN

cuts cost of magnet wire serving

VITRON 300 Glass Yarn has been developed to the exact specifications of magnet wire manufacturers who asked for a low-twist glass yarn of medium filament size. Here's the result:

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Improved edgewise bend resistance and smooth finish with less build-up.

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Foldabed, developed by No-sag Spring Co., Detroit.

YOUNGSTOWN Buckeye high carbon (MB-equivalent) basic steel spring wire goes into many of the high tensile springs, so popular now for upholstered chairs, divans, automobile seats and sleeping car berths.

Youngstown Buckeye high carbon basic steel spring wire, supplied for this and other types of special springs, is produced in gauge, temper and carbon content to meet the fabricator's specifications. It runs true and uniform in strength, ductility and other wanted characteristics, with proper balance in stiffness and workability to produce just the right degree of lasting comfort in the finished spring, without breaking or failure in fabricating operations.

Youngstown Buckeye high carbon basic spring wire is now available in a wide range of grades. Write or phone our nearest District Office.

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Manufacturers of Carbon, Alloy and Yoloy Steel

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WIRE - COLD FINISHED CARBON AND ALLOY BARS - PIPE AND TUBULAR PRODUCTS - CONDUIT - RODS - SHEETS - PLATES - BARS - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RAILROAD TRACK SPIKES.

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...BECAUSE

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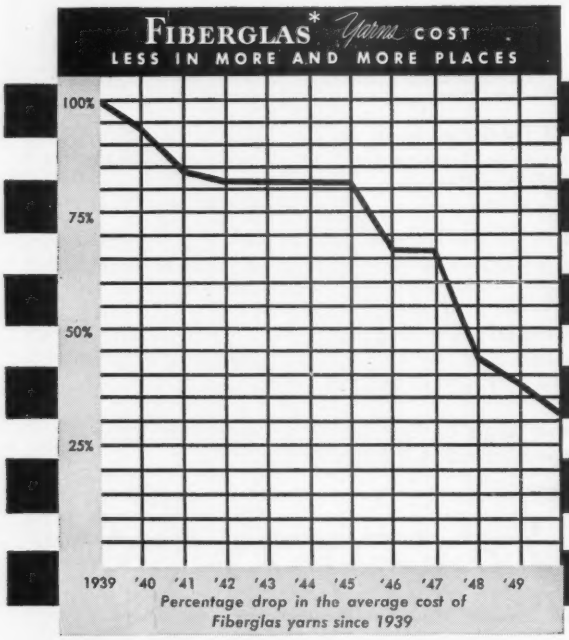
FIBERGLAS* Yarns COST
LESS IN MORE AND MORE PLACES
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- Improved round die design for wire, bar and tubing
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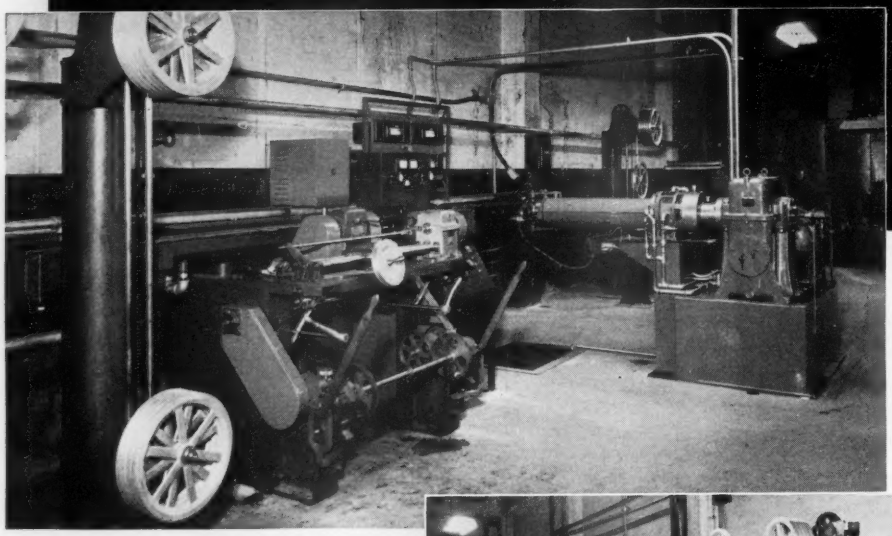
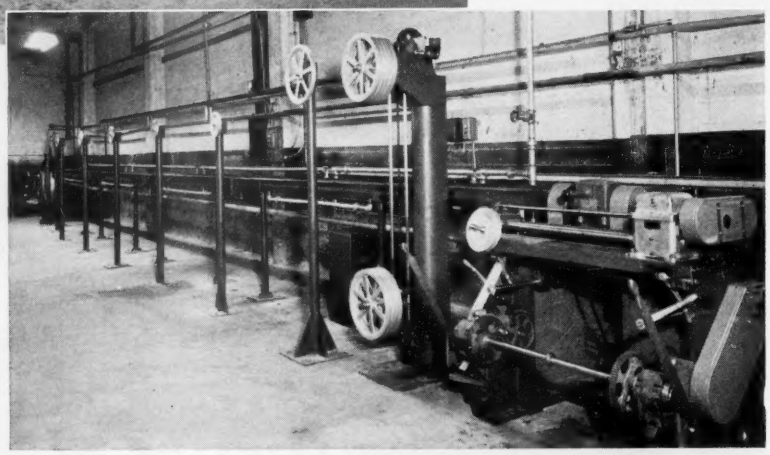
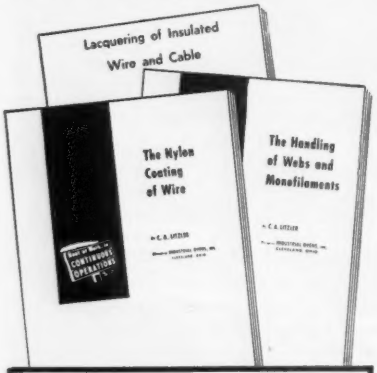
Complete Continuous System for Plastic Jacketing of Wire and Cable



A view from the takeup end of a complete extrusion line with nylon head tuber. Driven letoff stand and tension stand shown in the background.

A view of the same extrusion system showing capstan, cooling trough, tension control stand and continuous takeup machine.





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- "Lacquering of Insulated Wire and Cable"
- "The Handling of Webs and Monofilaments"
- "The Nylon Coating of Wire"

Available without charge to wire executives and operating men when requested on business stationery.

● Whether your coating material is nylon, polyvinyl chloride or other plastic or rubber compounds, complete IOI extrusion systems enable you to jacket wire or cable faster and at lower production cost. IOI machines for fine to medium wire sizes are usually equipped with a constant tension system drive and synchronized driven wire payoff stand to minimize actual loads on the wire itself.

Large-diameter wire and cable machines are equipped with heavy-duty constant tension drives. Pneumatically loaded wire accumulators at payoff and takeup ends allow for completely continuous jacketing of wire and cable.

These machines are typical of IOI's versatility in designing extrusion insulating systems. Similarly advanced engineering characterizes IOI equipment for the enameling and lacquering of electrical conductors.

INDUSTRIAL IOI ENGINEERING VERSATILITY OVENS, INC.

13825 TRISKETT ROAD CLEVELAND 11, OHIO

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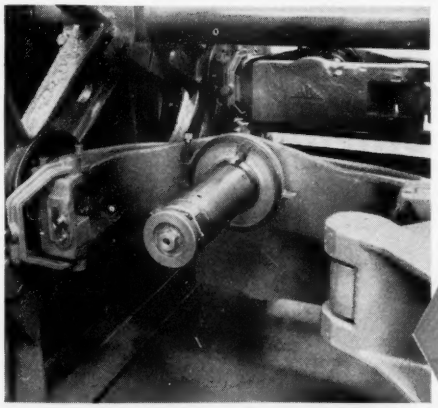
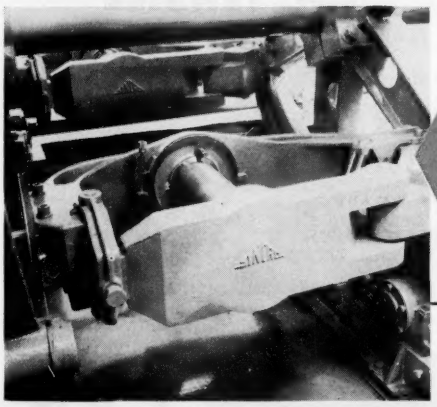
...with Fuster SYNCRO

PLANETARY STRANDERS

guarantees you more business!



SYNCRO OVERHUNG ARBORS provide for fast and convenient side loading. The Syncro arbor lock centers bobbin and eliminates "slap" or end-play.



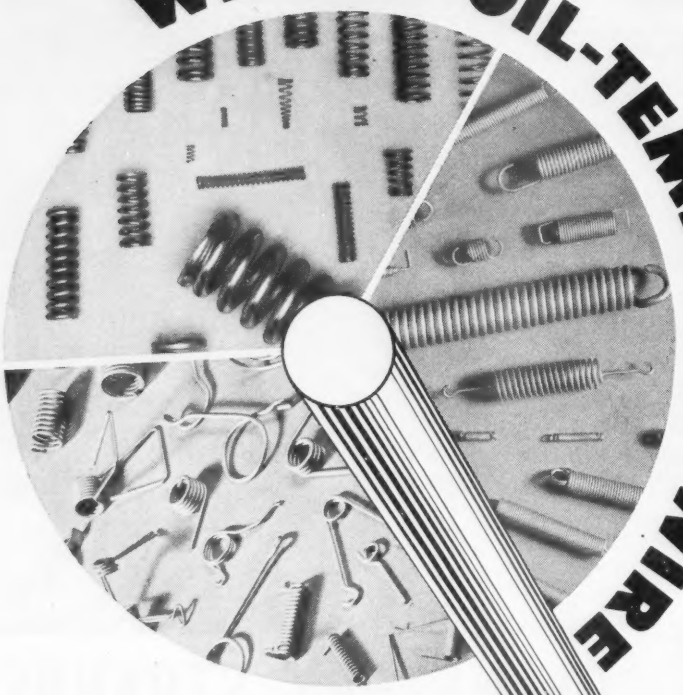
SYNCRO CRADLES are of cast steel, inherently balanced and equipped with a fast acting safety gate. An electric interlock on each cradle will stop machine if gate is not properly locked.

The WHY of speed is a question readily appreciated by the wire manufacturer. The HOW of speed has been developed by Syncro Engineering. Basic features of mechanical strength are indicated by such design factors as the use of steel rotor castings and cradles, forged steel cradle trunnions, self-aligning cradle bearings, steel stabilizing ring and crank arms, non-metallic support rolls equipped with roller bearings, and totally enclosed main drive gearing. The result of attention to such detail is reflected in higher practical speeds and greater operating efficiency.

Machinery for the Wire Industry

SYNCRO MACHINE COMPANY • PERTH AMBOY • NEW JERSEY • U.S.A.

WISSCO OIL-TEMPERED WIRE



UNIFORM IN TEMPER AND TENSILE

In common with other high carbon wires, oil-tempered wire can be as temperamental as an opera star unless it is handled with extreme care. Every step in processing calls for skilled craftsmanship — the kind of handling it gets in the hands of Wissco's many 25-year service men.

It's the knack which our metallurgists and mill men have in handling special wires that has made Wissco Oil-Tempered Wire an old time favorite with spring manufacturers. They like its uniformly high tensile strength and fatigue life.

You can obtain Wissco Oil-Tempered Wire in sizes from .009 to .5625 in coils, with diameters ranging from 8" to 72" and in cut lengths. Or, if you need any other type of high or low carbon steel specialty wire we can supply it. We make it round or shaped, in a wide variety of tempers, grades and finishes. Let us know your requirements.

WISSCO *Wire*

A PRODUCT OF WICKWIRE SPENCER STEEL DIVISION • THE COLORADO FUEL AND IRON CORPORATION

WIRE SALES OFFICE—361 DELAWARE AVE., BUFFALO 2, N. Y.

EXECUTIVE OFFICE—500 FIFTH AVE., NEW YORK 18, N. Y.

SALES OFFICES—BOSTON · CHICAGO · DENVER · DETROIT · NEW YORK · PHILADELPHIA

PACIFIC COAST SUBSIDIARY—THE CALIFORNIA WIRE CLOTH CORP., OAKLAND 6, CAL.

CF&I

Don't just pick any wire

Let us make it to fit the job exactly

Here in the mills of The American Brass Company, more than 100 different copper alloys are processed into wire in an almost unlimited variety of sizes and shapes, tempers and finishes. The result is that each wire is, in effect, tailor-made . . . especially adapted to particular problems of tooling, rate of production, and desired properties of the finished product. And there's a big difference—both in quality and unit cost—when the wire is exactly suited to the job!

The column at the right very likely holds the combination to that "one best wire." Our Technical Department will help you find it—and it may be easier than you think. Your inquiry entails no obligation whatever. The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

50234

For the right wire, look to

ANACONDA®

TYPICAL TYPES OF WIRE

Pin Wire	Hook & Eye Wire	Nail Wire
Screw Wire	Cotter Pin Wire	Rivet Wire
Chain Wire	Brake Lining Wire	Tie Wire
Slide Fastener Wire	Fourdrinier Wire	Welding Wire
Jewelry Wire	Trolley Wire	Brazing Wire

MATERIALS

Copper	Brass	*Hitenso Cadmium Bronze
Chromium Copper	Zinc	*Calsun Bronze
Deoxidized Copper	Phosphor Bronze	Ambraloy
Silver Bearing Copper	Nickel Silver	Special Copper Alloys
Gilding	Cupro Nickel	*T.M. Reg. U.S. Pat. Off.
Commercial Bronze	*Everdur	

SIZES AND SHAPES .002" TO .750"

(Extreme limitations—varying according to alloy and shape)

Round	Half-oval	Square
Half-round	Flat	Hexagonal
Oval	Keystone	Octagonal
	Irregular Shapes on Order	

FINISHES AND TEMPERS

Cadmium Plated	Bare	Oxidized
Bright Annealed	Tinned	

From Soft Annealed through Spring Tempers; put up on Spools, Reels, Coils or cut to Straight Lengths.

SUITABLE FOR THESE FABRICATING OPERATIONS

Redrawing	Riveting	Braiding
Cold Heading	Machining	Spinning
Hot Heading	Flat rolling	Weaving
Extruding	Edgewise winding	

All-Inconel radiant tube assemblies for use in pit-type carburizing furnaces. The radiant tubes were assembled by the Industrial Fabricating Company, Toledo, Ohio. The short-radius Inconel return bends were fabricated by the Commercial Metal Spinning Company, Toledo, Ohio.

NOW

Low Furnace Operating Costs with ALL-INCONEL Radiant Tube Assemblies

In practical terms, the use of all-Inconel® radiant tube assemblies means longer tube life, less down-time for repairs, and lower fuel bills.

Inconel resists corrosion, embrittlement, and destructive oxidation at temperatures up to 2000°F. Welded joints in Inconel have the same desirable characteristics as the alloy itself. These features mean long life and low maintenance for your Inconel radiant tubes. And you get lower fuel bills because the light walls possible with heat-resisting Inconel radiant tube assemblies give faster heating and require less fuel to bring your furnaces to working temperature.

One of the important factors leading to the availability of all-Inconel radiant tube assemblies is the development of the fabricated Inconel short radius return bend.

The Commercial Metal Spinning Company, Toledo Factories Building, Toledo, Ohio, supply them to the following specifications:

3½ in. O.D., on 5½ in. centers
4½ in. O.D., on 8 in. centers
5½ in. O.D., on 8 in. centers

The O.D. sizes shown can be obtained on other center-to-center dimensions on special order. Fittings for tube sizes other than shown are presently being developed.

Cold-drawn Inconel seamless tubing is available in a wide variety of diameters and wall thicknesses to meet any requirements.

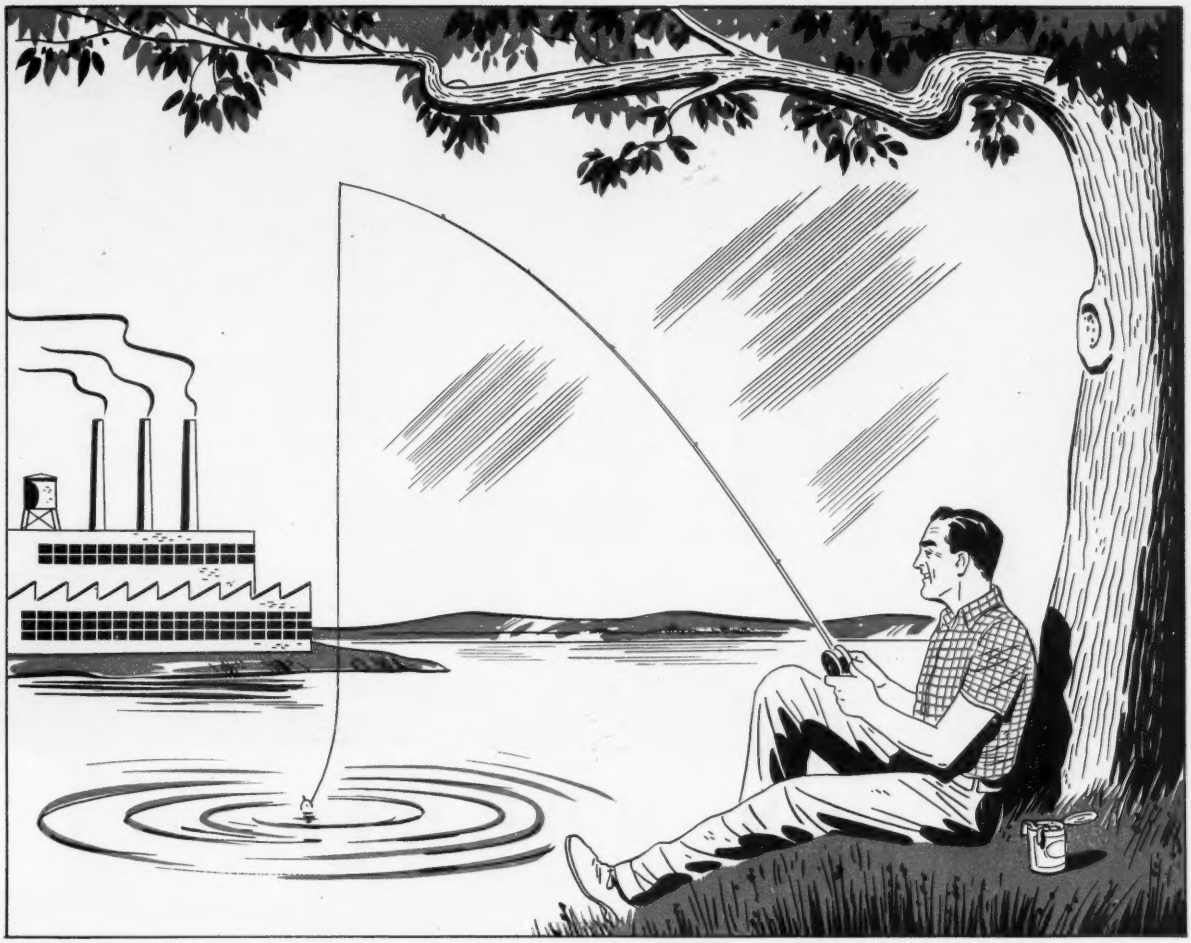
For specific information about Inconel radiant tube assemblies, write directly to Inco.

Remember, too . . . our Technical Service Department always welcomes an opportunity to help you solve high temperature and fabrication problems.

THE INTERNATIONAL NICKEL COMPANY, INC. • *67 Wall Street, New York 5, N. Y.*

EMBLEM OF SERVICE INCO TRADE MARK

INCONEL . . . for long life at high temperatures



HOW TO CATCH MORE FISH

(and produce *more* and *better* wire products)

Tall order? Too big a promise? Well, let's see . . .

To catch fish at all, you need a rod or pole, a hook and some bait — and a place to fish in.

To catch a *lot* of fish, you need a good deal of luck or knowledge, or both — *and plenty of time for fishing.*

Now, as you can see from a glance at our signature, we don't sell bait or rods or reels. Our business is making *wire drawing lubricants* — special — purpose compounds to produce the finish you require on all grades of steel, copper or brass.

We've been in this business a long time now and (our customers tell us) we've gotten pretty good at it. Good enough to save our customers plenty of time, trouble and money.

That means better wire products for you and *your* customers — *and more of the same!* It also means, if you get the point, that you'll have more time for fishing. For it stands to reason that more efficiency in the mill means fewer headaches for you, greater peace of mind — *and,* of course, the time and chance to catch *more fish!*

Sound like a "fish story" to you? Well, try us and find out. We've helped an awful lot of wire producers catch more fish!

WIRE DRAWING LUBRICANTS

Standard

INDUSTRIAL COMPOUNDS CO.

4500 WEST FERDINAND STREET • CHICAGO 44, ILLINOIS •

STANDARD SERVICE CENTERS

INDUSTRIAL COMPOUNDS CO.
C. R. Mehl, President
2037 Sacramento Blvd.
Los Angeles 21, California

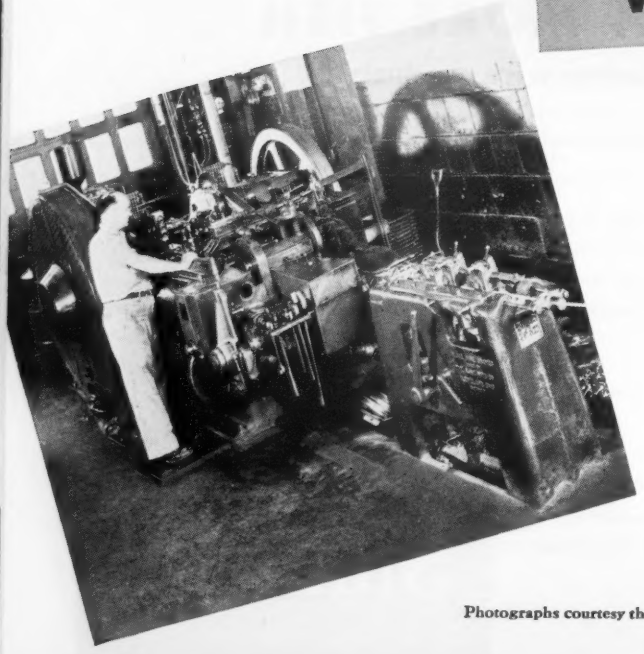
INDUSTRIAL COMPOUNDS CO.
C. R. Mehl, President
2425 Seventeenth Street
San Francisco, California

STANDARD INDUSTRIAL COMPOUNDS COMPANY
William Kinnery
Millbury, Massachusetts

COLD HEADERS NEED

AJAX-HOGUE

WIRE DRAWERS



THE efficiency and quality of product of Cold Headers is materially stepped-up by the attachment of AJAX-HOGUE wire drawers. The wire, being freshly drawn to unvarying diameter as it is perfectly coated and fed to the header dies, heads easier, more uniformly and with much less wear on the header dies. This improvement in cold heading substantially lowers the cost of production in addition to the saving effected by the use of hot rolled rod instead of cold drawn wire.

Write for Bulletin No. 111.

Photographs courtesy the Chandler Products Corporation.

THE AJAX MANUFACTURING COMPANY

EUCLID BRANCH P. O. CLEVELAND 17, OHIO

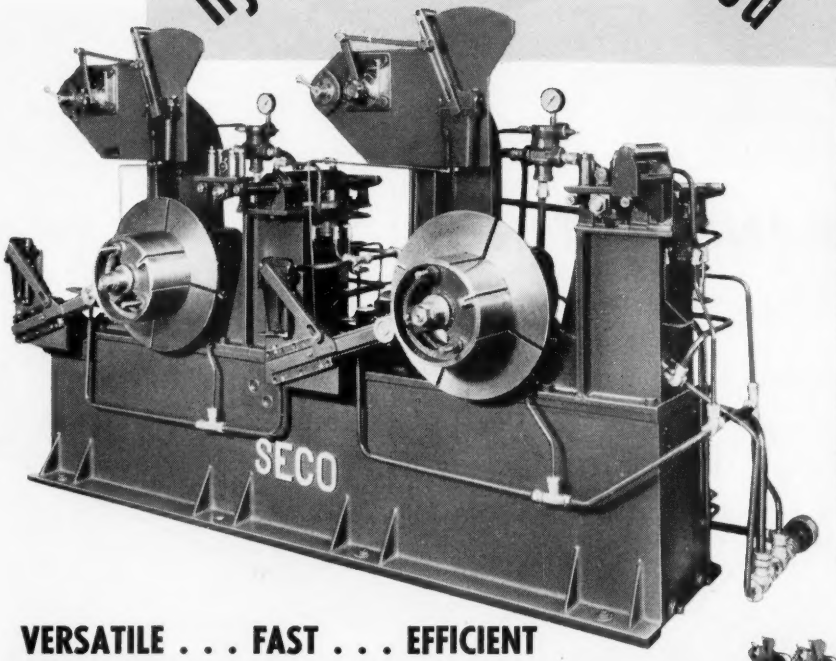
110 S. DEARBORN ST. CHICAGO 3, ILLINOIS

DEWART BUILDING NEW LONDON, CONN.

They Said It Couldn't Be Built . . . but We Did It!

SECO *Presents*

ITS NEW Hydraulically Operated WIRE SPOOLER



- Revolutionary Design!
- Quick Speed Adjustment!
- Controlled Tension!
- Adjustable Traversing!
- High Accuracy!

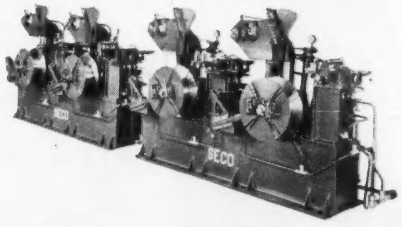
VERSATILE . . . FAST . . . EFFICIENT

ENTIRELY NEW in DESIGN and ENGINEERING

SECO, with its new Hydraulically Operated Wire Spooler, presents a revolutionary development in efficient wire spooling. An infinitely variable speed range from 0 to 4,000 FPM—accurate, adjustable traversing for wire gauges varying up to 20:1—controlled tension—and a new, original design that gives sensitive, fully adjustable operation—are among the superior features of this new Spooler.

A new rider-roll control, developed by SECO, automatically compensates for increase in coil diameter—assuring a constant linear spooling speed.

Each Spooler is engineered to solve your present production problem—with built-in flexibility to meet future requirements. Construction is rugged and compact—designed for economy, safety and ease of maintenance. Write today for full details and operating data.

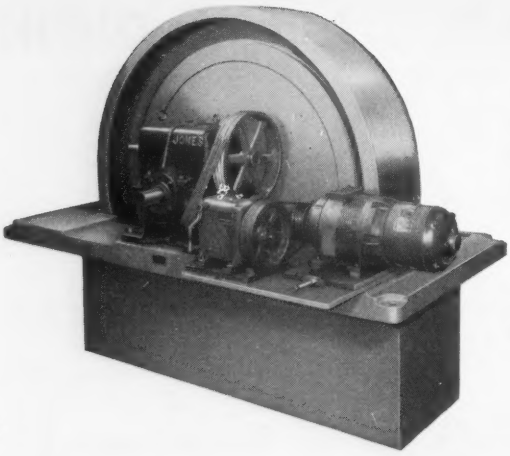


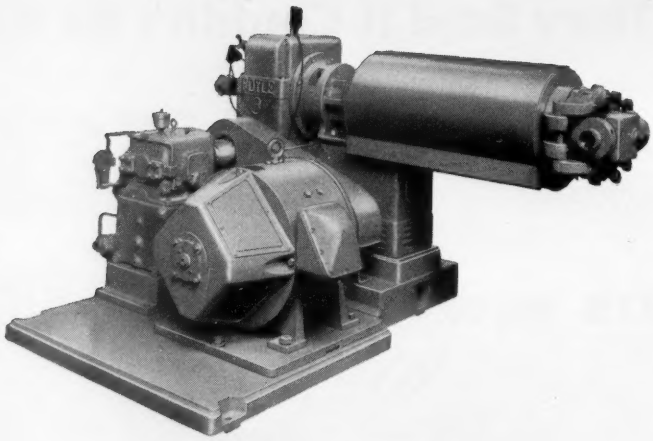
The Four Spindle Duplex Traverse Reel installation shown above handles tinned copper wire at speeds from 150 to 600 FPM. Wire sizes range from .100" thick by .200" wide to .045" thick by .500" wide. Wire is coiled on collapsible blocks, 10" diameter, 6" wide with 18" flanges for 250 pound coils —or on spools with 14" diameter cores, 6" wide with 24" flanges holding 450 pounds of wire. Tension from 75 to 150 pounds is regulated by a pressure control valve.

STEEL EQUIPMENT CO.

2890 EAST 83rd STREET • CLEVELAND 4, OHIO

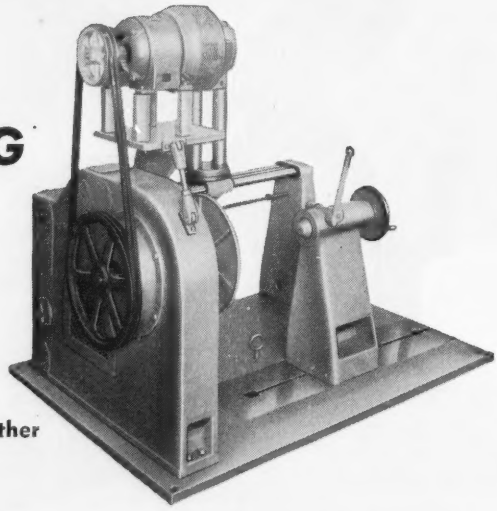
SECO



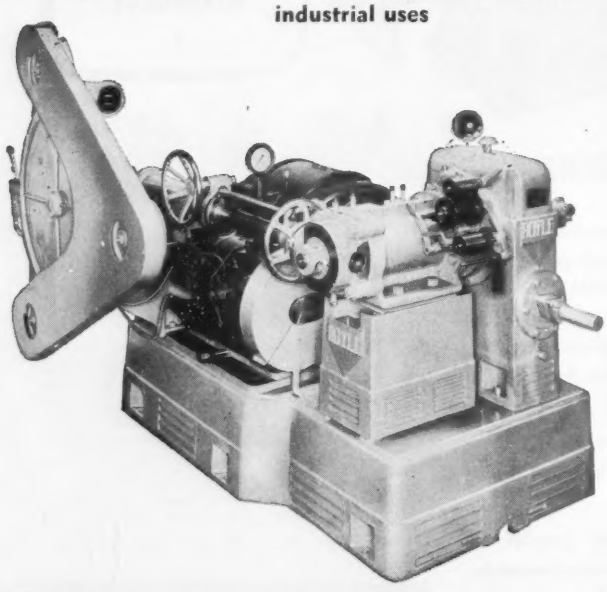


ROYLE

for WIRE INSULATING



- Continuous Vulcanizing Machines for Rubber Wire Insulation
- Plastic Wire Insulation Machines
- Strainers • Cooling Troughs
- Light Wire & Cable Capstans • Motorized Take-Ups
- Temperature Control Units for Extrusion Processes and other industrial uses



JOHN ROYLE & SONS

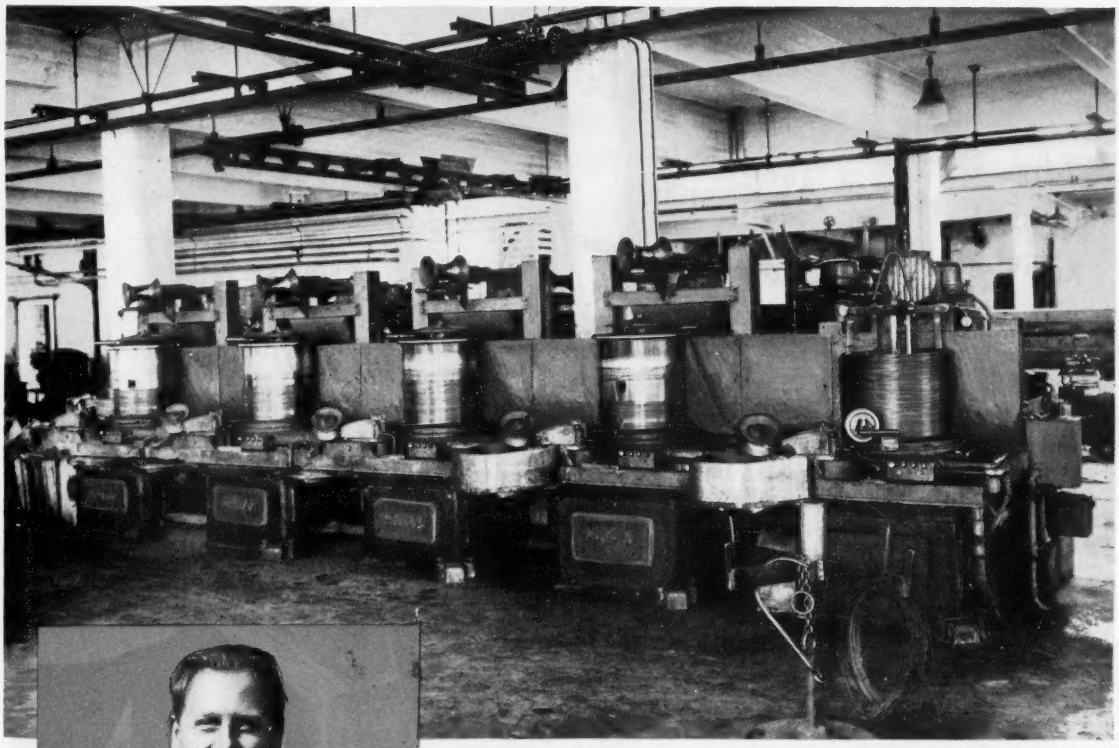
ROYLE
PATERSON
N. J.

PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN 1880

London, England	Home Office		Akron, Ohio	Los Angeles, Cal.
James Day (Machinery) Ltd.	E. B. Trout	J. W. VanRiper	J. C. Clinefelter	H. M. Royal, Inc.
REgent 2430	SHerwood 2-8262		JEfferson 3264	LOgan 3261

PATERSON 3, NEW JERSEY

Wire drawing machines

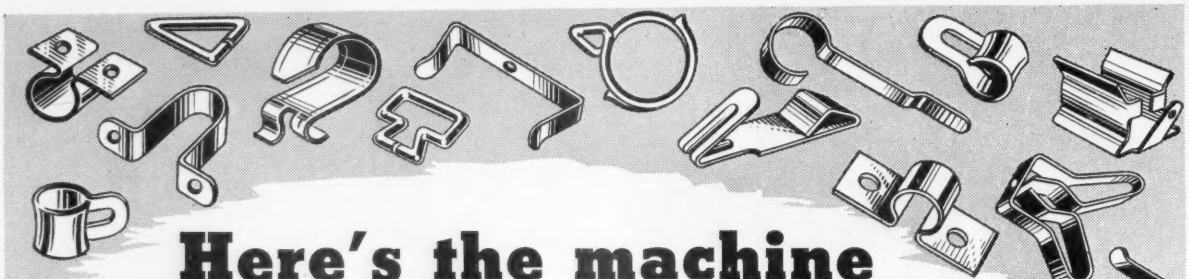


"Always reliable!" . . . was the operator's remark about this wire-drawing machine which has continuously produced steel-wire for our customer every single working-day for 10 years.

We manufacture drawing machines for drawing wire from rod max. ¾" down to 0.005" diameter of any ordinary material — ferrous and non-ferrous metals — and fitted with one or several blocks. May we have your inquiry?

MORGÅRDSHAMMAR

MORGÅRDSHAMMARS MEK. VERKSTADS AB · MORGÅRDSHAMMAR · SWEDEN



Here's the machine to increase your output of FORMED WIRE & STRIP PARTS

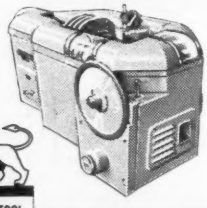
The **MACNAMARA**
MODEL M.I.4 Inclinable
Radial Automatic Multi-Slide

This new wire and strip former has no equivalent anywhere, it incorporates many unique features designed to speed production and cut setting-up time. The slide positions can be rearranged to suit the job in hand, and after setting in the vertical position the head of the machine can be inclined forward to allow easy delivery of the finished work.

Up to six slides can be added or subtracted as separate units, and infinite adjustment is provided for feed and timing.

A wide variety of wire and strip shapes can be produced, many at speeds high as 250 parts a minute. Forms wire up to $\frac{1}{8}$" dia. and strip up to $\frac{3}{4}$" wide.

Other Macnamara machines



M.I.7 *Automatic Multi-Slide*
STRIP AND WIRE FORMING MACHINE
Performs eight or nine follow-on press or bending operations, and produces up to 320 wire or strip shapes a minute. Forms wire up to $\frac{1}{4}$" dia., strip up to 2" wide.

M.I.3. *Automatic 3-slide*
WIRE FORMING MACHINE
A vast range of shapes can be produced at rates up to 300 parts a minute. Forms wire up to 0.080" dia. The M.I.3. Chain-maker produces completed chain at 200 links a minute.

THE BRITISH TOOL, MACHINE TOOL AND SCIENTIFIC INSTRUMENT SECTION, CANADIAN INTERNATIONAL TRADE FAIR TORONTO 29 MAY – 9 JUNE 1950

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A.C. Wickman LIMITED
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83 F 29

For today's high-speed wire drawing

change to the new

HOUGHTO-DRAWS

Faster! Faster! Faster! Today's call is for speed and more speed. And in the die, where the drawing actually takes place, the worth of the drawing compound you use is clearly revealed.

Houghton, maker of wire drawing lubricants for half a century, has constantly re-evaluated its line and kept it up to date to meet these demands for speedier production.

There's a new Houghto-Draw compound for wet wire and copper wire drawing. And another for replacing lime as a pre-coat on steel wire, eliminating baking. And still another new but proven aid to severe rod and bar draws, which again replaces lime. Not to mention new compounds to help sheet stamping and forming.

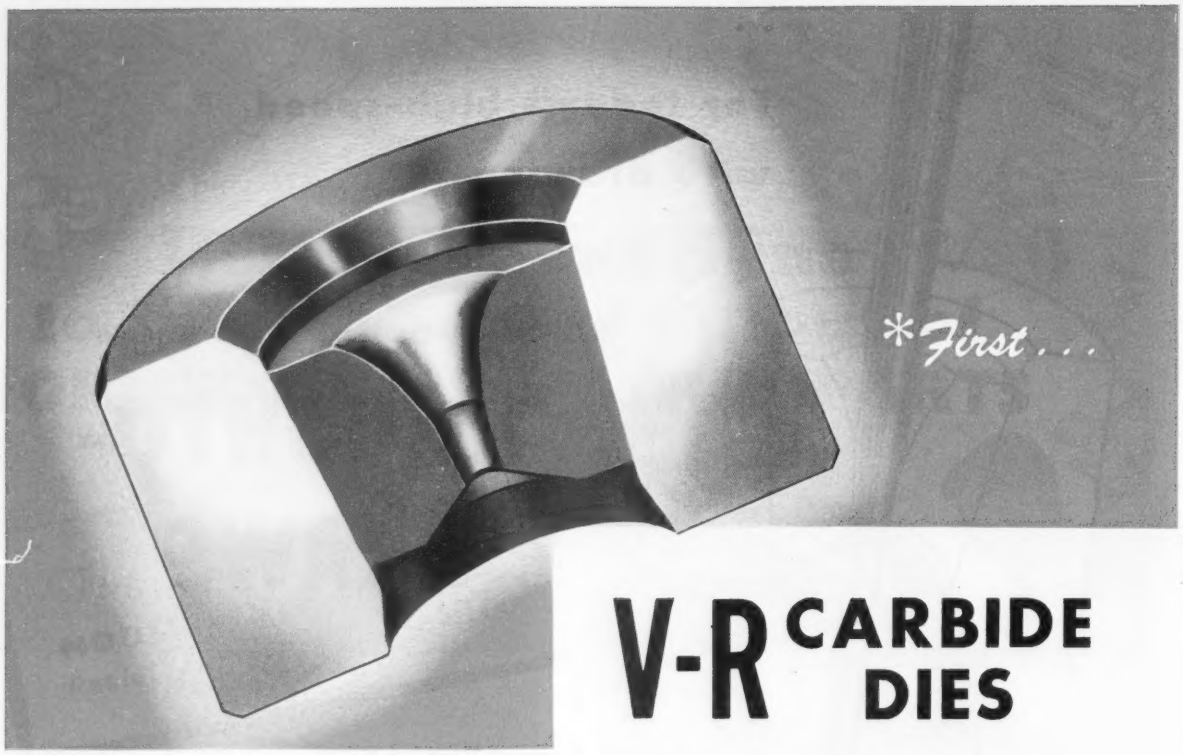
Wire men will want to investigate these aids to faster, trouble-free production — products that leave the wire brighter, that eliminate long soaks or wasted baking time. To start, ask the Houghton Man when he calls, or write E. F. HOUGHTON & CO., Philadelphia 33, Pa.

Drawing Bars?

If that's a problem, we call special attention to Houghto-Draw 357, which replaces lime. Advantages: quicker heating, cleaner to use, brighter finish, smoother surface, faster speeds, good die life. Write for Data Sheet.

HOUGHTON PRODUCTS FOR METAL WORKING

HEAT TREATING SALTS · INHIBITORS · CARBURIZERS
CLEANERS · RUST PREVENTIVES · DIE LUBRICANTS
CUTTING OILS · "FORTIFIED" OILS AND GREASES



V-R CARBIDE DIES

mean . . . high tonnage output at minimum cost

*First to develop extra wide tapered front and back openings for easy inspection and maintenance. No steel to cut when resizing or refinishing V-R Dies.

*First to design and develop the tapered nib construction increasing internal strength and providing perfect die concentricity.

*First to manufacture Carbide Die with preformed rough cored back relief to eliminate costly die room coring operations over the entire range of hole sizes.

*First to furnish Carbide Dies rough cored to finish, at hole sizes below .015". These rough cored dies are available in dies sizes R-O, R-1, and R-3, rough cored at .004" and .010".

V-R Carbide Dies combine every advantage known to the wire industry.

V-R Carbide Dies, R-1 thru R-6 with the NEW higher nibs are completely redesigned to improve drawing conditions and to allow for heavier drafting practice.

Eliminate unnecessary maintenance and cost NOW by changing to V-R Carbide Dies—The World's Finest!

PHONE

Your Nearest V-R Branch Office for Your Carbide Die Needs Now!

V-R Carbide Tools - Blanks - Dies • Tantung Cast Alloy Tools - Precision Castings • Toolholders - Inserts

V-R CARBIDE and TANTUNG

vascoloy-ramet corporation

WAUKEGAN • ILLINOIS

The Wire Outlook

Joining with us, the publishers of WIRE AND WIRE PRODUCTS, many of our regular advertisers, old and new, this month have stepped out of the beaten track of routine to help us commemorate our twenty-fifth milestone in the march of time.

We are grateful that so many of our good friends are willing to take note of our modest efforts on this occasion. To all of you we extend our most sincere thanks for your kindly felicitations and expressions of good-will. It has been a source of much satisfaction to have been able in so many ways to be of service to both our advertisers and our readers over the years. As a token of appreciation, the individual members of the staff of WIRE AND WIRE PRODUCTS pledge themselves anew to the task of greater service to our field in a manner that we trust will be fruitful of tangible benefits to it.

Sparked by the miners' success in securing a fourth post-war wage increase, other unions are beginning to angle for more money. While the natural tendency will be toward rising prices for a long time to come, these rapid, artificially spurred wage increases are something that can easily lead to a painful reaction. Labor leaders should take heed of this, if they are genuinely concerned with the welfare of their members. Shortages have helped to absorb the shock of previous increases thus far, but that condition is fast passing and our economic system can no longer digest these added costs without an upheaval.

Industry opinion varies as to how long the strong demand for steel will be maintained. Some foresee a drop in the second half. If there should be a tapering off in the Fall, it will hardly be serious and at the present time no inventory reductions are in sight.

Brass mills generally are operating at a high rate of production and top executives of several large concerns have expressed the expectation of continued good business throughout the year.

Last month the Basing Point Bill received a set-back by a one-vote margin that kept the bill from going to the Senate floor for debate. The delay keeps industry from adjusting itself to a pricing system that would help all fabricators who are not located in the immediate vicinity of supply sources. If we are to remain decentralized, and even to encourage it further, we need the legalizing of the basing point plan now.

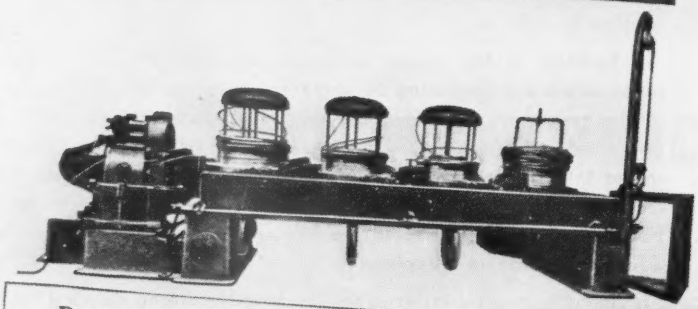
Demand for most wire products is good. Upholstery wire has fallen off somewhat. Merchant and manufacturers' wire, especially low carbon, is in heavy demand. Automotive wire and wire for building operations are both under exceptionally heavy pressure. The fastener business is good, while nails and fencing are in unusually short supply again. The trend toward buying finished sizes of wire for screw machine products, instead of buying rods and drawing, is continuing on the increase.

The rate of business activity is being maintained at a high level, reflecting the vigor and strength of the American economic system in spite of the many doubts inspired by the pressure of the Administration for extravagant "welfare" measures and the lethargy of the Congress. The latter has been called a "do-nothing Congress," probably because too few Democrats have been willing to support the Administration's rose-tinted projects. From this point of view it is doing well.

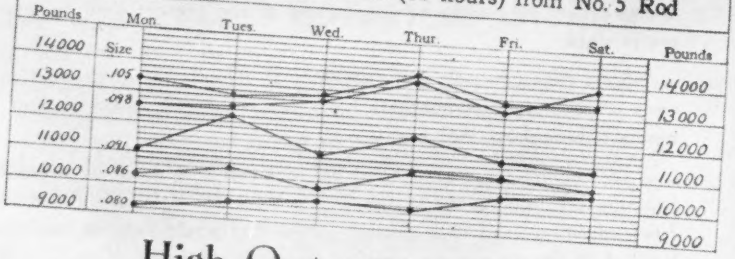
—from the Editor's Desk

These figures were pretty "hot" in 1926—but let us bring them up to date for you!

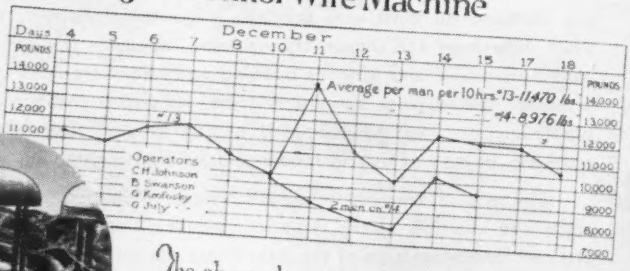
MORGAN
WORCESTER
ENGINEERS AND MANUFACTURERS



Production per man per shift (10 hours) from No. 5 Rod



High Output per Man
is the outstanding characteristic of the
Morgan-Connor Wire Machine



The chart above gives in the form of a composite curve the average output per man per day of four operators running eight machines at the Portsmouth Ohio Plant of the Wheeling Steel Corporation.

MORGAN CONSTRUCTION CO.
WORCESTER, MASSACHUSETTS, U.S.A.

WIRE AND WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip, Wire and Rod Products and Insulated Wire and Cable.

DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 25 MAY, 1950 No. 5

Designated as

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Reg. 511,530 U. S. Pat. Off.

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. . . eliminate the labor of handling large numbers of small parts . . . make it easy to assemble reels in four simple steps.

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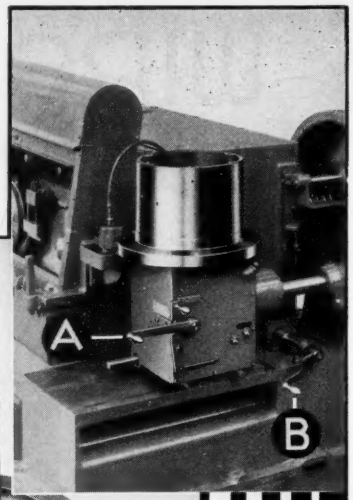
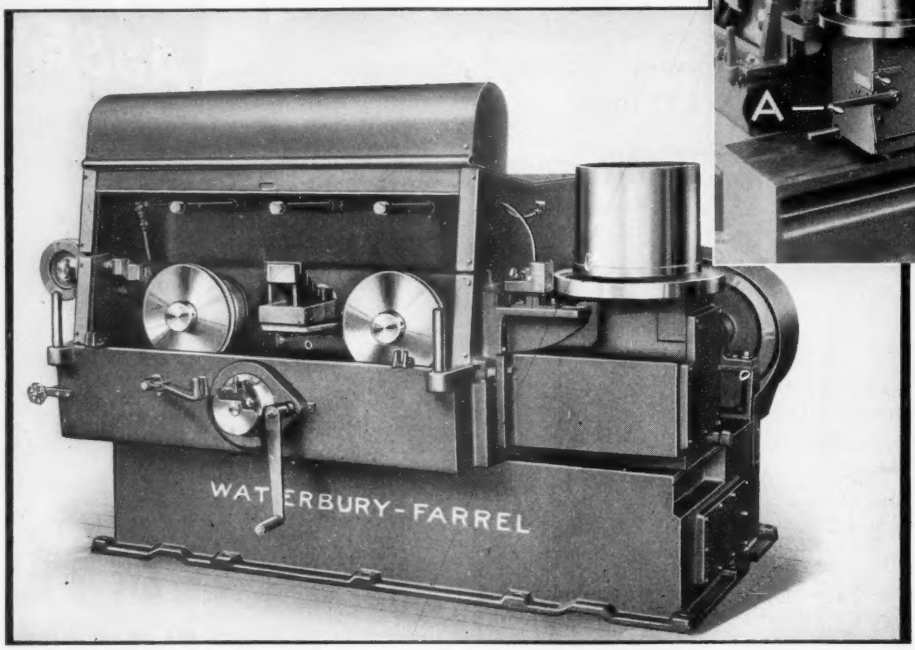
WIRE DRAWING MACHINES





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by WATERBURY-FARREL

WITH WIRE BLOCKS WHICH *rotate in either direction*

Upright Cone Continuous Machines with provision for quickly changing the rotation and position of block.

Two conveniently located removable handles do the trick in jig time—

A — changes direction of rotation
B — shifts position of block . . .

The machines are available with blocks of various diameters or with spooling devices. Our wire drawing machinery is described in Catalog W.

• WIRE AND ROD MACHINERY • COLD HEADING MACHINERY, ETC. •

WATERBURY FARREL
FOUNDRY & MACHINE COMPANY
WATERBURY • CONNECTICUT • U·S·A

CHICAGO CLEVELAND NEWARK, N. J.

WIRE AND WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip.
DRAWING — ROLLING — EXTRUDING — FORMING — FABRICATING

Vol. 25 MAY, 1950 No. 5

A Silver Wedding

By Kenneth B. Lewis

Consulting Wire Mill Engineer
Worcester, Mass.

WIRE & WIRE PRODUCTS is rounding out its twenty-fifth year of service.

★ ★ ★

DICK BROWN has just reminded me that **WIRE & WIRE PRODUCTS** is in its twenty-fifth year, and has suggested that as the duly licensed chronicler of the passing scene in wire I should make with the Smith-Corona. I have, accordingly, spent the past two or three days thumbing over my somewhat incomplete files, and have discovered, as might have been expected, that the histories of the magazine, the Wire Association, and the late revolution in wire mill practice are stranded together as neatly as one could imagine.

★ ★ ★

THE first issue of WIRE & WIRE PRODUCTS must have been that of May, 1926, for my earliest number, June of that year, is Vol. 1, No. 2. But I well remember a call from Sylvan Hoffman, the first publisher, that must have been six months earlier, to acquaint me with the impending project and ask my advice. I told Mr. Hoffman that the magazine would be a God-send to me and to all other purveyors of goods and services to the wire mills, who had never had any effective place to advertise. I promised an endless series of full-page ads, and as many editorial articles as he called for. Incidentally, I told him that while I welcomed the magazine, I was sure he was the wrong man to start it, because he knew nothing about wire. He told me that a knowledge of publishing was the only thing he needed. I didn't believe him, but a few years later Dick Brown demonstrated the truth of that statement.

Ken Lewis was born in Bridgewater, Mass., and educated in the public schools at nearby Quincy. He is a graduate of Harvard University. He spent 1904 to 1907 with the Bethlehem Steel Company, becoming Assistant Superintendent of the open hearth division. From 1907 to 1909 he was with the American Steel and Wire Company at Worcester doing experimental work on wire. He then joined the Morgan Construction Company, Worcester, and was with them until 1932, building wire mill equipment, at the end of which period he established his own practice as a consulting wire mill engineer, in which work he is now engaged.

KENNETH B. LEWIS

★ ★ ★

AMONG the ads in my June number are those of the Morgan-Connor, Shuster straighteners, the Vaughn Motobloc, Sleeper & Hartley, and, significantly, the Master Die, described by Abe Simonds as "the die that replaces chilled iron and the larger sizes of diamonds." Surely this is the distant rumble of the impending revolution. The other ads are small affairs, many of them of diamond dies. Among editorial articles are the second installments of stories by George Paff and Dwight Granger, foreshadowing their stalwart support of the magazine and its affiliated interests down through the years. A little ad on a back page caught

my eye. "WANTED. A young man familiar with all practical and technical details of wire drawing and forming—must have pleasant personality and ability to write. Send full details to Wire & Wire Products." If I had answered that ad the course of history might have been changed, and I might be spending MY winters in Florida.

★ ★ ★

IN the earliest numbers of the magazine there appeared many of those unmitigated pests, the German technical article, written always by Herr Doktor Ing Googlemyer, or some such, and translated, apparently, by his wife's cousin who needed the money, and whose idea of idiomatic English was to refer to hot galvanizing as "stove zincing." As Macbeth remarked, on a similar occasion, "It is a tale told by an idiot, full of sound and fury, signifying nothing." Dick used to run them too, in the early days, for they came over by the hundreds from the research sweatshops in Germany, till I begged him to let me see them first, and, if there was anything in them, let me translate them myself.

★ ★ ★

ADVERTISING support came early and generously to the new magazine. The regulars in the early numbers, beside those already named, include Koegel, Mossberg, Oakite, Watson, both Union and Vianney on diamonds, Van Miller with Steelskin, American Insulating Machinery, and Hubbard with his spools. Why is it that each of those names makes me think of Scotch and soda? Very early in the game there appeared the ad of Urdika Wire Die Works, offering the Elmarid die, character not specified. It was at that time, 1926, that I heard rumors about these wonder-dies, called on Urdika, and bought a set for 5-hole 14 for the Morgan-Connor. I carried them in my pocket for a couple of years, demonstrating them briefly here and there. It was in Europe in 1928 that they finally went hay-wire on some scaly rods and I threw them away. I was too dumb to realize that their life had just started. The carbide die industry owes me a bronze plaque for that pioneering.

★ ★ ★

THE only noteworthy thing I find in the journal in 1928 is Morris Simons' first offering of tungsten carbide under the name "Krupp metal." Morris had visited the Krupp plant and investigated the stuff in that year, and so had I, and perhaps others; I know Douglas Harvey was there, and bought dies for Reynolds.

★ ★ ★

THE May number of 1928 is the first in which the name R. E. Brown appears as publisher; at the time I never heard anything about this shift, don't know whether Hoffman was losing ground, or simply got an offer too good to refuse. I suspect the latter, as Dick had recently been publishing an organ of some sort for a bunch of road builders, and had presumably got the publishing fever. By this time I had outgrown the foolish notion that a publisher had to be an expert in the field of his organ, and welcomed Dick cordially. The only other event of the year seems to have been the appearance in the advertising columns of Carboloy, and, Oh, yes, a news story about interesting experiments with recording sounds on a moving wire.

★ ★ ★

IN the February number of 1930 I find the first ad of Morgan-Connor machines with air-cooling, and that suggests a subject for historical research. Regarding all these post-mortems, every man appears to have seen the occurrence in terms of his own part in it. The following account may be completely screwy, but it may stimulate other memories.

★ ★ ★

IT must have been about 1926 that I was walking through North Works with C. S. Marshall, and commented on the big pipes that discharged cool air downward into the bundles of rope wire being drawn. I told him I supposed it was to make the bundles easier to strip and handle, and was surprised when he said they believed the cooling improved the torsion test. In the ensuing argument I stated my firm conviction that taking away the heat from drawn wire was simply locking the stable door after the horse was gone. In my view he was treating a symptom. The real damage, I said, and I remember I was very positive, the real damage was done, not by the heat, but by the excessive speed or excessive reduction, of which the heat was merely an indicator. That's not the only firm belief I have had to renounce.

★ ★ ★

LATER, curiosity having been gnawing at me, I took some good rope wire, heated it to block temperatures, and found I had spoiled it. About this time Washburn Wire Company called for help. They made good wire up to Wednesday noon; the rest of the week the torsions were all over the lot. Observation showed that the big Carroll benches they had were so bulkly that when started up on a Monday cool, they would, until Wednesday, radiate the wire heat fast enough, but by that time they were simply hot as hades through and through. Washburn had gone to the extent of making hollow blocks and packing and re-packing them with cracked ice, to hold torsions. Billy Carroll, my design man at that time, conceived the idea which is now too familiar to require description, and built the first air-cooled block. It worked like a charm.

★ ★ ★

THE Morgan-Connor, apple of my eye, were at work on common products, though in some cases they were ripping down rope wire to patenting sizes, but I began to have dreams. I put some rope wire on a machine at Waukegan, and stood beside it spraying the blocks, in fact spraying the wire on the blocks, with water from a potato bug job I bought in the town. I learned two surprising things. One was that if I let the wire dry itself before it got down to 212 F° the coating was in no way impaired, the other was that the wire was considerably better on torsions than single-holed wire.

We air-cooled the Morgan-Connor at once, and got into the high carbon field.

★ ★ ★

WHILE in Germany in 1930, arranging for the production of continuous machines there, I was converted to the use of water inside the block. Morgans would never follow me there, but later I introduced it successfully at Aetna-Standard.

★ ★ ★

THE year 1930 was a climactic year for WIRE & WIRE PRODUCTS, and in fact for the wire industry. Dick advertised the first issue of the Directory, Index and Buyers' Guide. He hadn't had the magazine a year, yet he had been so active that it seems to me now, looking back, that I had known him for years. He had repeatedly argued with me the advisability of starting a wire association of some sort, and I had dissuaded him. I saw the value, but I was afraid the operating men would not, and said we should nurse them along slowly for a few years before taking a chance, for I reasoned that if we once scared them they would jump the fence and be off to the 40 acre pasture and we'd never get them back.

★ ★ ★

JUST at this time Fred Crosby, our electrical engineer at Morgan's, was on the exposition committee of the Association of Iron & Steel Electrical Engineers, and he proposed that Morgan put something into the show. Well, of course, Morgan never built anything small enough to go into a room, except wire machinery, so they asked me if I cared to have such an exhibit, charged, of course, against my profits, I accepted and said I would not only exhibit a Morgan-Connor Machine, but I would have an operator there and draw wire throughout the show. Well, I told Dick about this, and before you could catch your breath Dick had George Hartley booked to show one of his babies in action. Then Dick lined up a little group of stills, Ironsides, R. B. Haywood, Union Wire Die, possibly another, wangled a corner of the hall where we could all shack up together, extracted promises from me and two others to prepare papers, and ran an ad in the April number inviting all wire men to come to the exhibit and the technical sessions! The man who found a button and sewed a vest onto it must have been Dick Brown's grandfather.

★ ★ ★

WELL, it worked! An amazing number of wire men turned up; our little meeting room was crowded to the window-sills, and good-fellowship reigned. After I had read a paper on European wire practice, Dick stood up and asked how many would be interested in forming an association of wire men. All agreed. I think there was a hasty paper ballot, with only one no. Clarence Arms and Dwight Granger read papers. Then Dick and I, sitting on the platform, built the wire association. I kept suggesting names for a committee, and Dick called them to come up, and in no time at all we had a representative group committed to the formation of an association.

★ ★ ★

THE subsequent proceedings of the committee have been duly published; they took place in New York. My memory is faulty, and my files are shot. About all I remember is that I insisted that officers of the association, with the exception of the secretary, must be operating men. I pretended that I feared the sales group, to whom this new association would be a hunter's paradise, would get control. Actually I wanted to fix it so I could never be tapped myself.

★ ★ ★

THE organization meeting had been in June; in November the tentative constitution was published in WIRE & WIRE PRODUCTS, which had been chosen the official organ of the association. Dick was, and is, secretary, and the magazine is a part of the membership charge. Mrs. Brown didn't raise any half-witted children. Dick has never attempted to disguise the fact that the association fitted in with his plans for the magazine as the ham fits in with the two fried eggs on the platter. It was one of these marriages of convenience which sometimes turn out so well. He is, as always, the spark-plug, the motive power, and the directors are the steering gear. For years Dick and the magazine carried the deficits, which were perpetual. But I am not going to try to tell the story of the Wire Association; it is too well known. It is just as well, however, for the young fellows to be told that we had our anxious times, our quarrels, our deficits, and thank God a secretary who kept the pressure on all the time.

★ ★ ★

IN November 1930 I see the first Micro-Weld ad (Hi, Walter, how ya doin' out there in Arizona?) That reminds me of the relatively new practice of welding for drawing. Again I say that each of us sees history as himself surrounded by a lot of lesser bodies. How did this welding start? Here is the way I saw it. In 1920 I had the first Morgan-Connor running at Goddard Works in Worcester. The formulas had been worked out, so we knew about what output we could expect under all conditions, and the mills that still stuck to 150 lb. bundles looked hopeless. On the way to Goddard Works I used to pass the sign of a welding shop, and one day something clicked in my head and I went in to see what went on. Next day I was there with 100 feet of No. 5 rod cut into 100 pieces, and watched the operator put them back together. I filed down the flashes, took the rod to the machine, and saw it go at high speed to 4-hole 14 with only 15 breaks out of the 100 welds. I knew I had it. But regardless of repeated demonstrations it was years before I could persuade any wire mill to adopt the practice. It really never took hold till the carbide die came in solid.

★ ★ ★

BILL PARKIN'S first ad seems to have been in this 1931 issue. He is the first of the inhibitor men to show up, and this surprises me, for they were fighting each other like wild-cats. It is too early now

for us to evaluate properly the revolution that took place in wire, roughly between 1920 and 1940. I always have felt that it was my own baby, little Morgan-Connor, that lit the fuse, but if it was actually the Savior, if you don't mind my mixing a metaphor, (I got an A in metaphor-mixing at college,) then the inhibitor man was certainly John the Baptist. He went ahead and prepared the way, by making it possible to get clean rods and to see whether they were clean or not. Of course the Big Boom was the carbide die. In 1928 there was an occurrence worthy of note, the building of the Sheffield mill, which gave visitors a preview of many of the developments of later years, and I say this with pride because I laid out the mill and dragged in, often over bitter opposition, the novel features. And this reminds me that the gantry crane, the permanent tub, the straight line cleaning, the transportation by tramrail with total suppression of trucks, except electric lift trucks with rubber wheels, all novel features, to say nothing of the flipping of rods direct off hairpin hooks were not yet advertising extensively.

★ ★ ★

I HAVE been looking for the appearance of the bell type annealing furnace. During the early 1930's Electric Furnace Company ran many a cover ad of their thin-walled pots, fluid-fired with automatic control, and rubber hoses twisting around like snakes over the floor. This was the first step beyond the old 2" thick cast pot sitting in a coal hole and calibrated by spitting on the cover. In 1932 appears the first bell furnace ad, an electric job. Not until 1937 is there a fuel job, and it is Surface Combustion's, and apparently little or no attention is given to atmosphere. The accent is on normalizing rod. There are a few words about DX gas, and sand seal, but nothing that sounds serious. Not until 1939 does Lee Wilson appear, with an editorial article and an ad, but thereafter he is never absent.

★ ★ ★

IN 1933, at the association meeting, there was an occurrence that should have shaken the wire world, but that missed fire. The present writer gave to the world his formulas and theories on die stresses and reactive drawing. The world yawned and gave them back. Born thirty years too soon, that's my trouble every time, but my name will appear on the bronze tablet—just you wait!

★ ★ ★

ANOTHER event of 1933 is the appearance of the first Motoblox ad. Lee Vaughn had been fighting Morgan-Connor with the bull block for years, but finally fell back on the old political maxim, If you can't lick the opposition, join 'em. He had to swallow a lot of cracks about continuous drawing, but he did it gracefully.

★ ★ ★

TWO ads in 1934 tell a story of progress. One is for bakers, and seems to mark a turning away from the idea that bakers are something crude to be cobbled up by the machinery builder to hold his customer. Here is a specialist in combustion and drying systems offering bakers. The other event marks Dick Brown's success after years of effort, the appearance of ads of manufacturers of wire. When one started they all had to come in, and that put WIRE & WIRE PRODUCTS definitely over the hump.

★ ★ ★

THE events of 1937 include the appearance of ads of Elevator Supplies Co. and Syncro, and the announcement of the now widely known Trauwood process of patenting and oil tempering. Also the first ad of the flash baker. Here I am on solid ground, for I invented that baby myself and the circumstances are fresh in my mind. In the fall of 1936 I was struggling to get a good truckless layout in the old Aliquippa mill, and found that I was baffled at every turn by the damned bakers. Dreaming over the possibilities one day it struck me that I had not only been watching, but had been concerned actively in a trend that had great significance. I had seen baker temperatures climb from Palm Beach to 500 F., and ventilation shift gradually from casual leakage through cracks in the brickwork to actual flow of directed streams of air preheated outside the baking chamber, and each advance had cut the baking time. Why not bracket the target, said my subconscious mind to myself, shoot over the moon, and see what you get. My mind got as far as seeing a tank the size of a cleaning tub, right in the tub circle, in which rods would get about 750 F. and a cyclone of atmosphere to wipe the hydrogen off the rods as fast as it came out. I had already found that with a fast bake a direct heat was perfectly safe, and as John Morrison was about the only baker man who dared to use direct heat, I turned the thing over to him to detail. The Morrison Flash Baker was the result, and it was three times as fast as my estimate.

★ ★ ★

IN 1938 appears the first ad of Aetna Standard wire machines. War business and a change in management pushed them into the background but, they are now reappearing in the advertising pages.

★ ★ ★

1939 brought in the first news story and ad of Lee Wilson, as stated before, and also the Mordica Lectures, a perpetual memorial to that man of a thousand friends, Jack Mordica. He was the association's first president, and as such, a tireless worker for its building up, and a general purveyor of help and encouragement to the whole wire world. We are all his debtors.

★ ★ ★

THERE was nothing of note in 1940. The impact of the war on the wire industry was almost unnoted, except as it quickened general business. There was no similarity between the two wars our generation has fought through our wire connections. No barb wire expansion this time, except to take up the slack due to the withdrawal of the European sup-

pliers from the overseas market. No terrific expansion in wire rope, except for ship rigging and the like, for there were no miles and miles of mine fields hemming in the German submarines. They broke out too quickly from the small German coastal area.

★ ★ ★

IN 1941 a bizarre event worthy of passing mention was the sudden emergence of Mr. J. J. Whoosis as spokesman for the industry. Where he came from nobody knows, and at the war's end he seemed to simply de-materialize, apparently feeling that his mission was accomplished. As a close associate of Mr. Whoosis at one period I can say that his proudest moment was when he learned that he had attracted the attention of the F.B.I., and was causing them sleepless nights. Perhaps Dick Brown will tell that story some day. There was a promise implicit in some of Mr. Whoosis' last messages that at any time of unendurable stress he might reappear.

★ ★ ★

I WENT on through 1942 and 43 and then quit. My thumb was getting sore, and on reflection I realized that nothing more was going to happen. Continuous drawing was so firmly established that it was difficult to find an ad that mentioned single holers. The straight line cleaning house was nearly universal, the gantry crane well in the lead. Patenting was in excellent shape, batch annealing had hit a high in uniformity and delicacy of control never dreamed of even ten years before, and atmospheres had reached a point of perfection which permitted dry drawn wire to hold a lubricating coat through the process. I distinctly recall predicting in 1913 that this point would never be reached, and it's in print. Wire mill trucks were all in the museums by 1943.

★ ★ ★

INHIBITORS were in good shape, the flash baker looked good for a long run. In fact little has happened in the past seven years beyond the modernizing of various old mills which had been creeping in that direction for quite a spell. There are practically no disputed matters now, unless possibly the moot point of the future of reactive drawing. I refuse to get into that brannigan again.

★ ★ ★

IF I have said comparatively little about the carbide die it is merely because it is in the front of everyone's consciousness most of the time. It is the most significant tool that has appeared in our time. Who would have thought, when WIRE & WIRE PRODUCTS first appeared, that a situation would come about in which it would take practically a genius to make scrap?

★ ★ ★

IN these twenty-five years the wire industry, the Wire Association, and WIRE & WIRE PRODUCTS have jointly pulled off the third great revolution in wire production. Nominally independent, these three co-operate as effectively as the three legs of the milking stool. The future looks good.

★ ★ ★

San Francisco - Friday, June 16, 1950

THE PACIFIC COAST REGIONAL MEETING of the WIRE ASSOCIATION at the SIR FRANCIS DRAKE HOTEL

Registration and get-together starts 10 A.M., at the hotel. Fee $6.00. Plant inspection trip in the afternoon to the mills of the California Wire Cloth Corporation at South San Francisco. Busses will be provided.

In the evening: Cocktails at 6 P.M.; Dinner at 7 P.M. (cost of dinner included in fee).

A well-known and forceful speaker will talk on current conditions.

TECHNICAL SESSION on the use of borax in wire processing—8:30 P.M.

Two papers will be presented, followed by an opportunity for questions:

1. Use of Borax in Drawing High Carbon Steel Wire, by Curtis Voightlander, Supt., Union Wire Rope Corp., Kansas City.
2. Wire Finishes and Trade Requirements, by C. R. Mehl, President, Industrial Compounds Co., Los Angeles, Cal.

Program Chairman: Karl H. Baessler, Wks. Mgr., California Wire Cloth Corp.
Chairman of Meeting: Wm. Mohr, Supt., The California Wire Cloth Corporation

Please send your reservations immediately to

THE WIRE ASSOCIATION
RICHARD E. BROWN, Executive Secretary
300 MAIN STREET STAMFORD, CONN.

Twenty-five Years of Continuous Service
to the Wire Industry Through

Wire and Wire Products,

a monthly magazine, **giving** the
most complete **coverage**
among **WIRE MILLS**
and wire product fabricating plants
of any paper published,

Wire and Wire Products
is the **only paper** in its field.

Because it is published monthly, your advertising goes on selling your products longer than is possible in a weekly.
In the wire industry, it is "tops" and the best medium through which to sell machinery, equipment and supplies needed by the field.

Circulation is
concentrated and
therefore offers you the most
for the money.

Advertise in it regularly
to **build** your
sales in this great, fast-moving industry.

WIRE and WIRE PRODUCTS
300 Main Street
Stamford, Connecticut

We Salute You,

Our First Advertisers

WIRE
AND WIRE PRODUCTS

SILVER ANNIVERSARY
MAY, 1926 — MAY, 1950

Twenty-five Years of Continuous Service to the Wire Industry.

Looking Back with the Suppliers

By Edmund D. Sickels, Advertising Manager
WIRE AND WIRE PRODUCTS
Stamford, Conn.

THUMBING over the early issues of WIRE AND WIRE PRODUCTS, it is a source of great satisfaction to note the numerous concerns, some large, some small, who were then catering to the needs of our industry.

★ ★ ★

MANY of them have since developed considerably in stature, paralleling the developments within the wire industry; some have unfortunately fallen by the wayside; a few are now operating under different names; and several have developed other interests and no longer serve our field.

★ ★ ★

SINCE WIRE AND WIRE PRODUCTS made its debut in 1926, the principal suppliers are the same good old outfits, mostly under the same managements, with here and there the scions of the founders having risen to posts of responsibility in the service of the industry.

★ ★ ★

THESE concerns may properly be accorded a very special niche in the Wire Hall of Fame, particularly those who have carried along in WIRE AND WIRE PRODUCTS without a break for twenty-five years. The names (see page 388) are those of companies whose advertising appeared in the first year of our existence and whose advertising currently appears in this issue of the magazine.

★ ★ ★

WHILE the foregoing are mentioned specifically, we are impelled to doff our hats to the host of other advertisers whose sales stories appeared in WIRE AND WIRE PRODUCTS in the second, third, fourth and other later years, who are now represented regularly in its advertising columns. Nor can we omit tribute to the more recent arrivals, whose bread and butter has depended on an excellence of products and services and who already have become soundly integrated parts of the wire complex.

★ ★ ★

WITHOUT the devoted thought and tireless energy of these suppliers, old and new, it is safe to say that modern speeds and quality of products might not have come so far. The industry's suppliers have contributed to a tremendous extent to the technological and mechanical progress that in the short space of a quarter of a century has brought us to a high state of operating efficiency.

★ ★ ★

BETTER dies, lubricants, drawing machines, stranders, coatings, equipment, ovens, furnaces and what-not have made for vastly better products at higher output per man-hour, which in terms of wages and purchasing power means bigger markets for what we are making.

★ ★ ★

OUR own beginning was a humble one. The growth of WIRE AND WIRE PRODUCTS has paralleled a most interesting and important stage in the development of the industry. To a very considerable degree, the success of our efforts has been due to the ever-growing willingness on the part of both subscribers and advertisers to cooperate with us in furnishing the field with information of value to it.

★ ★ ★

THE birth of the WIRE ASSOCIATION in 1930 brought to wire men a progressive and integrating force for good. It has molded the entire field into a closely-knit unit. Whereas wire was once considered just a metal-working activity, it has been withdrawn from that conglomerate category and acquired the dignity of being a distinct and distinctive industry —a change of status advantageous to the field's component parts and to suppliers alike. Through its instrumentality and growing influence, wire men have come to know and respect one another, have interchanged ideas, in publicly presented papers and in private conferences, that have contributed greatly to the advancement of practices and procedures in the manufacture of wire and wire products.

★ ★ ★

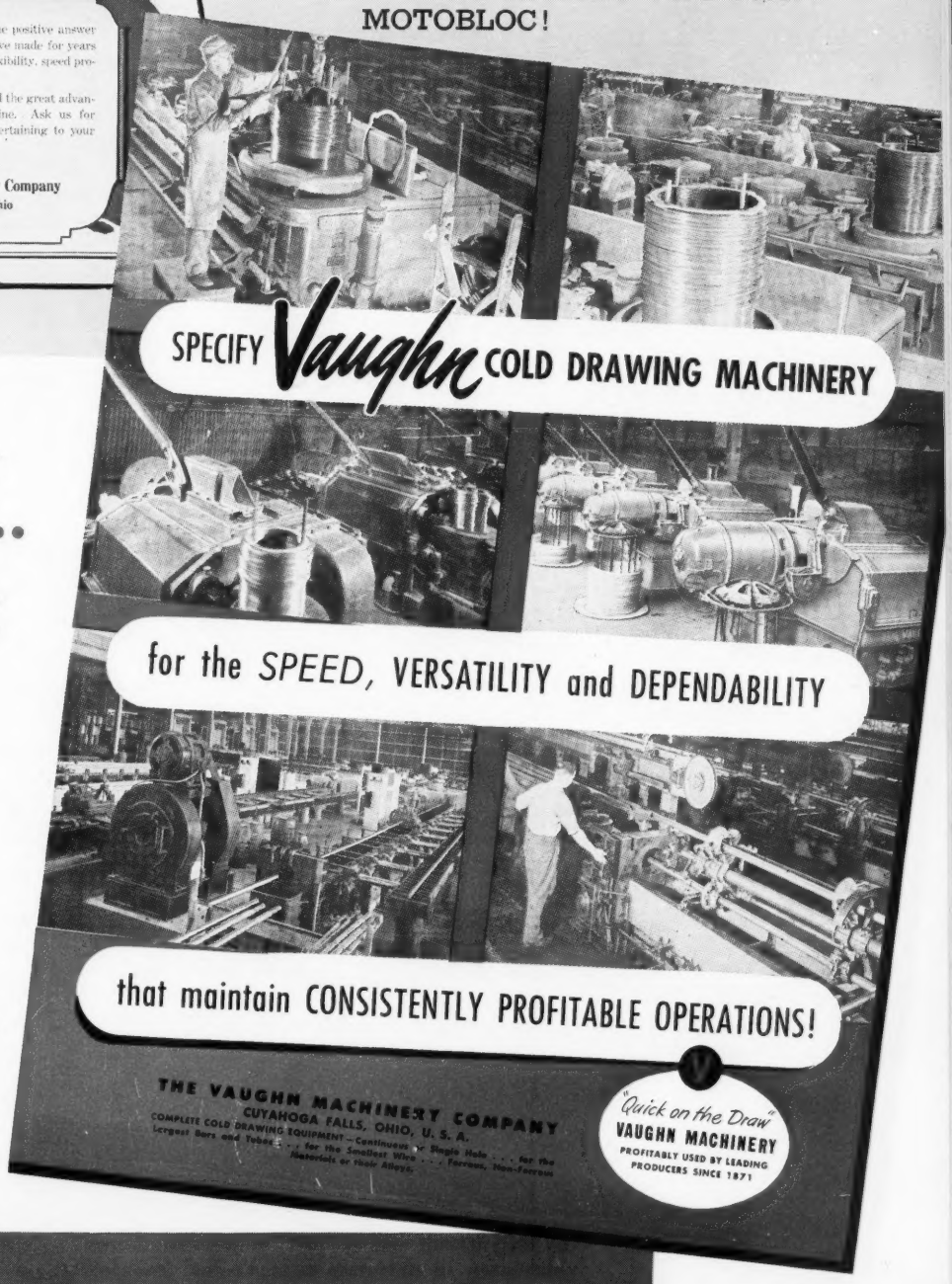
WE have endeavored to render to our industry the greatest possible service and of one thing have become convinced — it could not have been done alone. We salute you our readers, our advertisers and the members of THE WIRE ASSOCIATION on this, the 25th Birthday of WIRE AND WIRE PRODUCTS. We can promise you that, with the inspiration of your continued active cooperation, the next quarter century will see even bigger and better things.

★ ★ ★

The VAUGHN MOTOBLOC
(PATENTS APPLIED FOR)
Efficient, compact, simple—yet the positive answer to the demand manufacturers have made for years for a machine that would give flexibility, speed production—and lower net costs.
You can't afford to pass unnoticed the great advantages offered you by this machine. Ask us for definite information and data pertaining to your particular use.
The Vaughn Machinery Company
Cuyahoga Falls, Ohio

25 YEARS AGO...

Our first advertisement in Wire and Wire Products showed the pioneer individual variable speed wire drawing machine . . . the famous VAUGHN MOTOBLOC!


SPECIFY Vaughn COLD DRAWING MACHINERY
for the SPEED, VERSATILITY and DEPENDABILITY
that maintain CONSISTENTLY PROFITABLE OPERATIONS!
THE VAUGHN MACHINERY COMPANY
CUYAHOGA FALLS, OHIO, U. S. A.
COMPLETE COLD DRAWING EQUIPMENT—Continuous or Single Hole . . . for the Largest Bars and Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys.
"Quick on the Draw"
VAUGHN MACHINERY
PROFITABLY USED BY LEADING PRODUCERS SINCE 1871

AND TODAY..

VAUGHN leads with the Complete Line of quality cold drawing machinery.

- **MOTOBLOC**
- **MOTOBLOX**
- **RINGBLOX**
- **TANDEM & CONE CONTINUOUS MACHINES**
- **DRAW BENCHES**
- **TAKE-UP FRAMES and Accessory Equipment**

Vaughn, Motoblox, Motobloc—Reg. U.S. Pat. Off.

THE VAUGHN MACHINERY CO.

CUYAHOGA FALLS, OHIO, U. S. A.

COMPLETE COLD DRAWING EQUIPMENT—Continuous or Single Hole . . . for the Largest Bars and Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys

AMONG those who advertised in that dim, distant first year which has passed into the limbo of time, the memories of which are still poignant, are.

American Insulating Machinery Co.

American Pulley Company

Balloffett Dies and Nozzle Co.
(Now Balloffett-Vianney Wire Die Co.)

Broden Construction Company
(Now Wean Equipment Corp.)

Cochaud Wire Die Co.

Hallden Machine Co.

Hubbard Spool Company

M. D. Kilmer Company

R. H. Miller Company

Morgan Construction Company

Mossberg Pressed Steel Co.

Nopco Chemical Company

Oakite Products, Inc.

Scott Testers, Inc.

Seneca Wire and Mfg. Co.

F. B. Shuster Company
(Now Mettler Machine Tool, Inc.)

Sleeper and Hartley, Inc.

Vaughn Machinery Company

Vianney Wire Die Works
(See Balloffet-Vianney)

THE concerns above all advertised in the first year of WIRE AND WIRE PRODUCTS' existence and the advertisement of each of these companies appears in this special section with the exception of the Morgan Construction Company, whose ad appears on page 376, and the Wean Equipment Corporation, whose current message occupies the inside front cover of this issue.

New... A DEVELOPMENT OF 92 YEARS' EXPERIENCE

All phases of operation of the press are from a single, compact control console which may be located at the most convenient point near the press. The control may be either push-button for automatic cycling, or lever operated manual control. Any press operation can be stopped *instantly*.

ROBERTSON

"Packaged"

OIL - HYDRAULIC

LEAD ENCASING PRESS

Compactness is the key-note in the design of this new press . . . for it is indeed a "packaged" unit, incorporating in a single construction the pump, drive, valves, speed control devices, oil reservoir, etc. This not only results in saving floor space but keeps major pressure lines short and direct

Robertson's standard of rugged construction has been maintained throughout to assure maximum servicability. The use of oil for the hydraulic fluid provides perfect lubrication and longer life of working parts.

A wide margin of safety is provided in the pump which is designed for 7000 p.s.i. although only 6000 p.s.i. pressure is normally used.

For a press with maximum efficiency and dependability and minimum maintenance . . . investigate the new Robertson "Packaged" Oil-Hydraulic Lead Encasing Press.

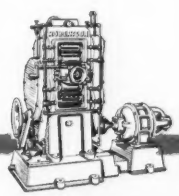
SEND FOR LITERATURE.

JOHN Robertson COMPANY, INCORPORATED

125-137 WATER STREET, BROOKLYN 1, NEW YORK

Designers and Builders of all Types of Lead Encasing Machinery

Since 1858



Lead Sheath Stripping Machine

The First Issue of Wire and Wire Products

Vol. 1, No. 1, May, 1926

By Richard E. Brown, President and Editor
WIRE AND WIRE PRODUCTS
Stamford, Conn.

AN initial editorial foreword in the first number states:

"WIRE AND WIRE PRODUCTS is born to help every drawer, former and user of wire. It will fill the want that the wire industry has long felt—for a medium that will disseminate news and valuable information. It will sponsor the best interests of the industry at all times."

★ ★ ★

THE many, oft-received words of appreciation that readers have been kind enough to express, during the past quarter century, would seem to indicate that our ambition has been fulfilled—even though it is a never-ending job with ever-growing standards ahead of us to be achieved.

★ ★ ★

GEORGE A. PAFF, then Superintendent of the Rod and Wire Department of the Wheeling Steel Corporation, wrote the lead article in the May, 1926, issue, entitled "My Thirty-five Years of Wire." Paff began his wire career in the rod mill of the Steelville Wire and Nail Company in Steelville, Pa.; in 1891. Probably few today will even recall the concern. He worked under Harry Jansen, a Swedish millwright who, while not proficient in the use of English, could "swear by note" in perfect English when his temper got the better of him, which was often. George Paff's first duty was to clean the sand from between the gear teeth of the Williamson Gravity Discharge Rod Coiling Reels, the first built, owned by General Manager John Williamson and Harry Jansen. The real Czar of the organization was the Head Roller. That he was an important man may be gathered from the fact that his daily wages ran from

R. E. BROWN, President and Editor, Wire and Wire Products.

$60.00 to $75.00 for each day's turn. Mr. Paff's account of the working conditions and the mill practices of that era, which were carried through to 1926 in a series of installments, remind us strongly of the Mordica Memorial Lecture given by Clem McGowan in 1948.

★ ★ ★

THE second article described "The Manufacture of Iron and Steel Wire in Germany." It states that the iron should contain from 0.06% to 0.12% carbon, 0.35% to 0.50% manganese, with small amounts of phosphorous and sulphur and traces of silicon. They started with 5 mm wire, square or round, in coils averaging 176 pounds in weight. Pickling with sulphuric acid was standard procedure, but the time in the pickling tub was ¾ to 1½ hours for rolled rod and ½ hour for annealed wire. No mention is made of inhibitors or of liming. The wire was dried in an oven and then drawn through a series of holes in a steel plate until such time as the desired diameter was produced. No reference is made to drawing speeds and it is likely that they were exceedingly slow by 1950 standards.

★ ★ ★

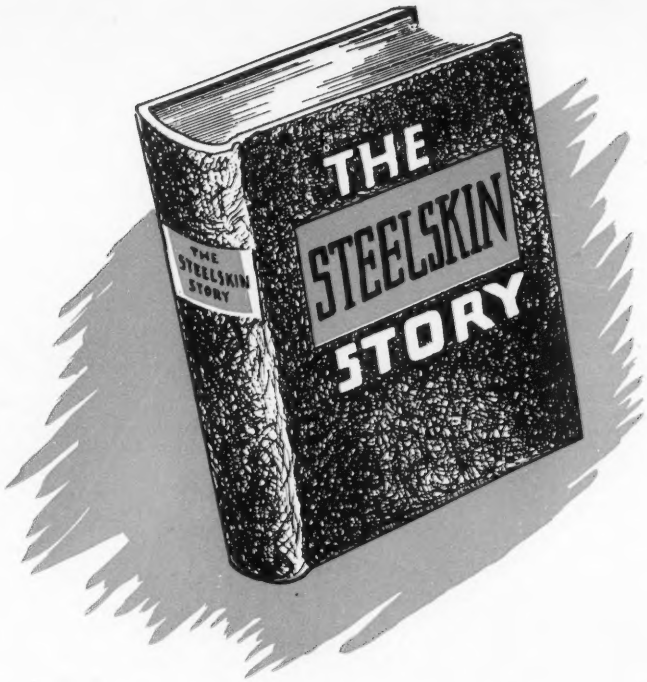
A. R. PETERSON then with the Standard Machine Works Company, contributed an article entitled "Pointing Wire by Electricity." The method described was one of placing the wire in a pair of gripping jaws, one of which was movable, hooking on a pair of terminal clips and electrically heating the wire to a cherry red, pulling the grips apart until the wire broke, thus providing a pointed wire that could be readily threaded into the die.

★ ★ ★

J. B. NEALEY, Surface Combustion Company, wrote on the "Reduction of Tungsten Filament." He notes that tungsten, up to very recently, had been a "rare" element, but at that time had been made a tonnage production item by the General Electric Company. Mr. Nealey describes the reduction process, the making of sintered ingots from tungsten powder, its hot swaging into rods of .030" in diameter, after which it is drawn to average diameters of .0025". From here he takes his readers into processes of making lamps.

★ ★ ★

"GETTING the Best Out of Diamond Dies" was the theme of an article by Victor J. Boulin of Vianney Wire Die Works. Early this year Mr. Boulin organized his own business, through which he is still concerned with this problem for his customers.



AT the lusty age of sixteen, "STEELSKIN" had already come "Up To The Majors," when its writeup appeared in the first issue of this magazine, just 25 years ago. It is proud that, along with WIRE and WIRE PRODUCTS, it has since then consistently "Burned Up The League" in every phase of its performance.

"STEELSKIN" first saw daylight in 1909, the year of the founding of the R. H. MILLER COMPANY. Even at birth "STEELSKIN" was in a Triple A Class of its own, appearing as the result of a radically new process in the manufacture of wire drawing lubricants. During its 41-year span of Major League life, Steelskin's faultless performance has won it All-Star rating in wire mills from coast to coast—and, in fact, throughout the world.

IN the early thirties, when Mr. Randolph V. Miller succeeded his father as president of the company, he organized an extensive research and development program that has had increasingly important practical results in new lubricants and methods. In 1935, Mr. Walter A. Smigel joined the firm and under his direction concrete technical improvements have been made in many applications of metal forming lubricants. For instance, during the last war, "STEELSKIN" developed intricate new lubricants for drawing such diversified military supplies as brass and steel cartridge cases, mortar shells, aircraft tubing, stainless steel airplane wire, and signal corps wire.

Since the war, the R. H. Miller research staff has been devoting its full time to the pioneering of still better lubricants for all types of metal drawing. Among recent significant developments are processes for the elimination of lime, the exclusion of lubricants from the die box, and the improvement of specialized finishes for plating, spring wire forming, welding, and many other end-uses.

R. H. Miller laboratory engineers are always ready to analyze special lubricating problems. Their recommendations are made for the specific purposes of increasing production, cutting manufacturing costs, eliminating waste, and developing products of higher quality.

No matter how difficult your lubricating problem, a "STEELSKIN" product can solve it. R. H. Miller's 41-year span of truly Major League experience is at your disposal. Actual performance data—reliable as an Official Baseball Guide—has been compiled over the years and is yours for the asking.

Write, wire or phone today, and an R. H. Miller lubricating expert will be at your service.

R. H. MILLER CO., Inc.

HOMER,
New York

Established
1909

The article outlined a series of points that die users should keep in mind to secure good die life and offered suggestions as to forms on which records of individual dies could be maintained. At that time the practice of keeping production records on dies was not general.

★ ★ ★

L. D. (DWIGHT) GRANGER, then a metallurgist for the Wickwire-Spencer Steel Company and now living in retirement on his Warren, Massachusetts farm, presented a learned dissertation on "The Elongation of Wire and Its Products." It discusses the degrees of elongation that different wires are expected to stand before reaching the elastic limit or breaking point. He is not concerned with fact or theory, but with having an understanding of elongation factors, so that specifications may be given that wire makers can meet. The May article was the first of a series of installments.

★ ★ ★

...and Nopco takes pride in having been associated with both for the past 25 years.

Our wire and tube drawing compounds have been among the superior lubricants serving manufacturers for the past generation. But, to be frank, we are NOT satisfied.

Since first we advertised our compounds in *Wire and Wire Products* in 1926, drawing techniques and equipment have improved tremendously, drawing speeds have increased 500 to 1000 per cent. Yet we are not content to believe that lubricants have progressed at a comparable pace.

Of course there have been improvements: Readily soluble compounds, with high neutral fat contents, that provide more uniform, superior lubrication; compounds that work well on spring and other high carbon wire; pH control, helping to achieve optimum results at time of application. But we are determined to go further.

And with this in mind, we have established a special department—devoted to hard-hitting fact finding and continuous experiment... with the *one object of making better and better wire, tube, and shell drawing compounds.*

We invite you to work with us. Let us know your lubricating requirements and problems. We'll gladly put our wealth of accummulated experience and up-to-the-minute laboratory facilities at your disposal. From mutually-developed data, you may profit immeasurably.

NOPCO TRADEMARK EVOLVED THRU RESEARCH

*Reg. U. S. Pat. Off.

Nopco Chemical Co., HARRISON, N. J.

Formerly National Oil Products Company

Branches: Boston • Chicago • Cedartown, Ga. • Richmond, Calif.

VARIOUS other brief articles were offered: one on "Trademarking Wire Products," another on the "Function of the Wire Jobber," a description of the "First Continuous System of Wire Rolling" in which an invention of J. P. Bedson of the Bradford Iron Works, England, is given. This was a wire rod mill using the Morgan principle of having the rolls horizontal and having each roll driven by gears. Other miscellaneous features like News of the Industry, New Patents and so forth, were carried, all of which are to be found in WIRE AND WIRE PRODUCTS today.

★ ★ ★

TWENTY-FIVE years is not a long space of time, except that out of an individual's mature and active business life, it represents quite a chunk. By 1926 the Wire Industry had long since emerged from its swaddling clothes and developed into a robust, healthy and highly technical industry. Nevertheless, in the twenty-five years that have since so quickly sped by us, developments of tremendous importance have taken place in processes, in the refinement and perfection of equipment, in the variety and quality of wire and the practical applications of metallurgy.

★ ★ ★

ONE of the outstanding developments during this period has been the trend of wire men to lean more heavily on the suppliers. Twenty-five years ago, for instance, lubricants were simple and often "home-made." Machinery and equipment were to a considerable extent built right in the wire mills' own maintenance departments. Today few mills prepare their own lubricants or manufacture their own machinery. The day of the specialist is in full flower, with better, faster and relatively less costly products being offered that it pays the mills to buy.

★ ★ ★

ANOTHER major development of importance to the industry in this twenty-five-year span was

"THE MACHINES THAT PUT THE 'RINGS' IN SPRINGS"

Life began 40 years ago
—for us in designing and building special machines for working and forming all shapes of wire, strips, etc., calling for Speed, Efficiency and Accuracy. This experience qualifies us to serve Your special needs.
Your inquiries invited

SLEEPER & HARTLEY, Incorporated
Worcester, Massachusetts, U. S. A.

AUTOMATIC STRAIGHTENING AND CUTTING MACHINERY

Equipped with

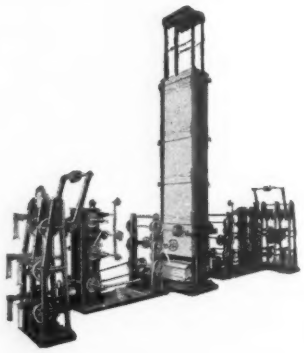
FLYING SHEAR

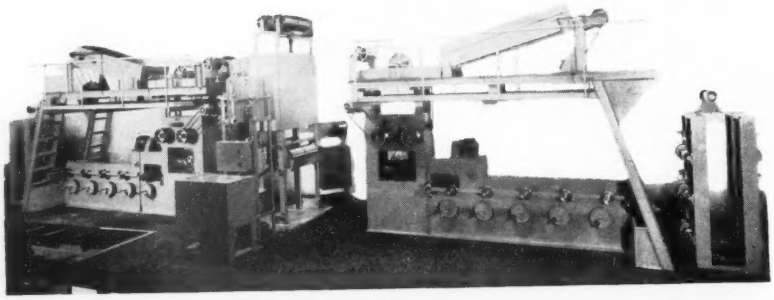
for

ALL KINDS OF MATERIAL

THE HALLDEN MACHINE CO.

THOMASTON, CONNECTICUT





EST. 1855 AIMco INC. 1915

"American" AIMCO INSULATING MACHINERY COMPANY

REG. U.S. PAT. OFF.

517 West Huntingdon St.
Zone 33

PHILADELPHIA PENNSYLVANIA U.S.A.

While our business was established in 1855 and incorporated in 1915, our first advertisement in the issue of Wire and Wire Products of September 1926, showing our heavy wire enameling machine of that date, is shown at the left. Our present model #997 with speed variator, electric pre-annealer, circulating system, etc., is illustrated to the right. This latter illustration shows the oven shortened to illustrate the top sheaves.

the organization of the WIRE ASSOCIATION in 1930 through the efforts and the cooperation of WIRE AND WIRE PRODUCTS and the designation of the magazine as the official publication of the Association. Ever-growing harmonious relationships for over twenty years have characterized the connection between the Association and the industry through this representation. The first meeting resulted in a membership of forty men, which has built up to more than eight hundred and fifty and now includes men in the industry in practically every foreign country in which wire is made.

★ ★ ★

1926 represented a good year for wire men, but 1950 a vastly better one. Looking ahead, our industry is faced with the pressing challenge of cutting costs further—WIRE AND WIRE PRODUCTS takes upon itself the burden of assisting its field in the successful meeting of this challenge.

★ ★ ★

TO WIRE MILL MEN

Have you considered joining the WIRE ASSOCIATION?

*

You are cordially invited to become a member. Dues are $15.00 a year, which includes a subscription to WIRE & WIRE PRODUCTS and a copy of the Annual Buyers Guide.

*

THE WIRE ASSOCIATION
300 Main Street
Stamford
Conn.

MANY SHAPES, MANY FINISHES
. . . For Thousands of Uses!

Quality control at Seneca allows you to plan production without future worries about material variations. Iron, steel, low carbon, high carbon, tempered or untempered, aluminum and bronze wire are all produced according to the same high standard.

Shapes
Square—Keystone—Flat-Round—Half-Round—Special Shapes—Straightened and cut.

Sizes
Number 40 W & M Gauge (.007) and larger.

Finishes
Liquor Finish—Bright Galvanized—Coppered—Enameled All Colors—Annealed—Tinned—Oil Tempered.

Thousands of Uses

Aircraft	Cable	Hair Pin	Reed
Armor	Car Seal	Hat	Regulator Spring
Armature	Clips	Hat Pin	Ribbon
Bee	Clock Spring	Heddle	Safety Pin
Belt Hooks	Cotter Pins	Hooks and Eyes	Spark Coil Core
Bobby Pins	Curtain Springs	Link Fabrics	Special Springs
Bonnets	Drapery Pin	Lock Springs	Spiral Binding
Bookbinders	Fish Hook	Mattresses	Stapling
Bottlecap	Fish Tape	Needle	Stitching
Box Stitching	Florist	Picture Cord	Umbrella
Brooms	Fuse	Pins-Ropes	Valve Spring
Brushes	Glass Netting	Pin Ticket	Weaving
Button	Grape Tying	Piston Ring	Wire Cloth
	Gutter Broom	Plow Steel	

Save time and money by depending on Seneca Quality Controlled Wire to meet your specifications. Write today for quotation and delivery schedule.

SENECA
WIRE & MANUFACTURING COMPANY
FOSTORIA, OHIO — ESTABLISHED 1905
REPRESENTATIVES AND WAREHOUSES IN ALL PRINCIPAL CITIES

In the News 25 Years Ago

Do you recognize them?

MICHAEL O'HAYER has been appointed vice-president and general manager of North and Judd Mfg. Co., New Britain, Conn., manufacturers of non-ferrous wire and other products.

★ ★ ★

J. S. APPLEGATE, formerly with the Wagner Electric Corp., has joined the Sterling Varnish Co., Pittsburgh, as specialist in electric wire insulation.

★ ★ ★

L. DWIGHT GRANGER, metallurgist, Wickwire - Spencer Steel Co., gave an address on wire springs before the Boston Chapter, American Society for Steel Treating at M.I.T. on May 7th.

★ ★ ★

WILLIAM EDENBORN, 78 years old, died on May 14th, after a week's illness. He organized the first wire mill in St. Louis in 1870, followed by other mills, one of which in 1899 he incorporated as the American Steel and Wire Company of N. J., later sold to the U. S. Steel Corp. for a sum said to be $100,000,000. He was the inventor of machines for making nails and barbed wire.

★ ★ ★

JOHN C. SCHEELER has been elected president of the Buffalo Wire Works Company, Inc. to succeed his father, the late Martin Scheeler. The company is over fifty years old and a prominent manufacturer of wire products.

★ ★ ★

COL. W. A. ROEBLING, 89, builder of the Brooklyn Bridge and president of John A. Roebling's Sons Co., died on July 21st. Since building the Brooklyn Bridge he had devoted his time to the direction of his wire manufacturing plant.

★ ★ ★

FRANK B. UNGAR has been appointed assistant to the general manager of sales of the Ludlow-Saylor Wire Company of St. Louis.

★ ★ ★

GEORGE ROBERTS, JR., of Pittsfield, Mass., has bought the Thistle Wire Works of Lee at a price said to be $75,000. The plant specializes in the manufacture of wire screening used in paper mills.

★ ★ ★

MOSSBERG PRESSED STEEL CORP.

Greater service from a new All Welded Steel Take Off Reel designed to meet present day requirements.

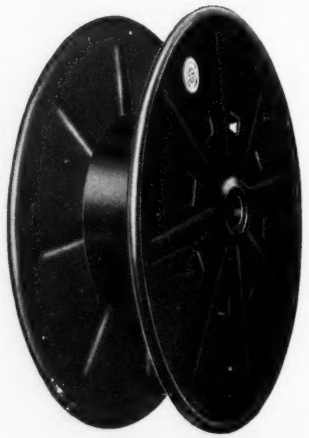
Usual maintenance expense eliminated by adoption of this new design wherein all parts are welded into one homogeneous unit.

Reel sides are embossed with radial reinforcing ribs for increased rigidity with rolled edges for additional strength and to facilitate handling.

Complete line of spools and reels for both processing and shipping all kinds of bare and insulated wires and cables. (Send for Catalogue W-104)

MOSSBERG
Pressed Steel Corp.
18 WEST STREET
ATTLEBORO, MASSACHUSETTS, U. S. A.

James Day (Machinery), Ltd., 90 Regent Street, London, W.I., England



All Welded Steel
Take Off Reel

DIAMOND WIRE DRAWING DIES

"BALLOFFETS, ALWAYS . . ."

Thus was announced in 1926 the availability of BALLOFFET dies by one of the largest and oldest concerns in the business. BALLOFFET set out to establish a dependable source of supply for fine diamond dies of uniform quality. BALLOFFET is the only diamond die firm having won the Army-Navy E three times for the excellence of its dies.

Thanks to the recent merger of the Balloffet and Vianney selling branches in America the new organization is today in a position to serve you even better and you are invited to avail yourself of a service that through adequate facilities and long years of experience has developed die-making to a high degree of perfection.

BUY "BALLOFFET-VIANNEY'S, ALWAYS"

BALLOFFET-VIANNEY WIRE DIE COMPANY, INC.

6825 ADAMS STREET

GUTTENBERG, N. J.

Manufacturers of quality diamond dies since 1870

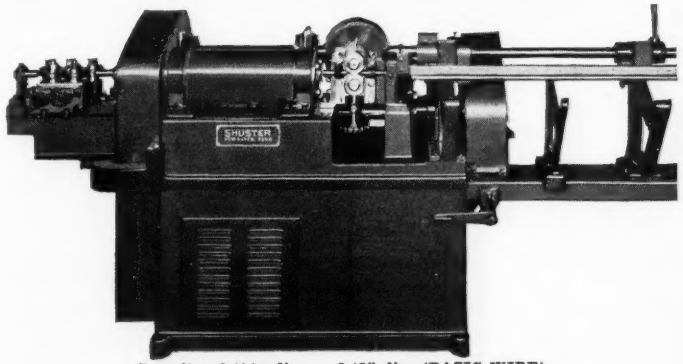
This New, Economical "SHUSTER" *Cuts Costs* AND *Accurate Lengths!*

Model 2AB

Automatic

WIRE STRAIGHTENING AND CUTTING MACHINE

This new "SHUSTER"—with its five gear-driven straightening rolls—handles even badly twisted wire with ease. Square and rectangular as well as round wire may be straightened and cut to exact lengths. Other "Shuster" features that assure high speed, quality production are: almost continuous wire travel, rapid cut-off, V-belt motor drive, ball and roller bearings, and extreme rigidity throughout. Write for details.



Capacity: 3/16" dia. — 3/8" dia. (BASIC WIRE)

Mfd. by METTLER MACHINE TOOL, INC., 132W Lawrence St., New Haven, Conn.

SHUSTER *Automatic*

Since 1866

WIRE STRAIGHTENING AND CUTTING MACHINES

Representatives in all principal cities and in foreign countries.

Congratulations:

to Wire and Wire Products

in its 25th year . . .

from

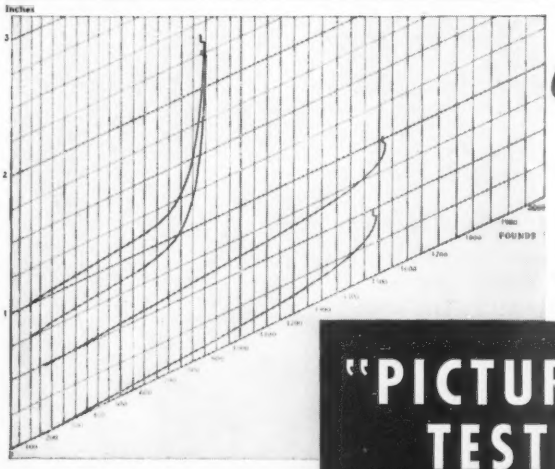
Hubbard Spool Company

in its 37th year

HUBBARD SPOOL COMPANY
1624 Carroll Avenue • Chicago 12, Illinois

Hubbard

STEEL SPOOLS AND REELS . . . METAL BOUND
SPOOLS AND REELS . . . STEEL TRAVERSES
LIGHT WEIGHT REELS . . . WOOD REELS



Congratulations
TO
"WIRE AND WIRE PRODUCTS MAGAZINE"
on 25 years of distinguished service to the Wire Industry

"PICTURIZED" TESTING
SOLVES MANY PROBLEMS

IN charts like the above, * Scott Testers graphically depict the altered physical characteristics of wires resulting from various manufacturing processes.

With capacities from 0 to 2000 lbs. tensile, the various * Scott Testers give you intimate and accurate knowledge and control, from finest filament up to tire, cable and other heavy wires.

REQUEST CATALOG 49

* Trademark Registered

SCOTT TESTERS, INC. 55 Blackstone Street Providence, R. I.

Scott Testers — Standard of the World

CLARENCE S. ARMS has resigned as president of the Wheeldon Wire Co., West Brookfield, Mass., to become manager of the wire drawing machinery department of Sleeper and Hartley, Inc., Worcester.

★ ★ ★

WINSTED has a new enameled wire industry, the Sweet Manufacturing Co. It will manufacture enameled wire under a new formula discovered by **Mr. Sweet.**

★ ★ ★

AN addition to its branch factory at Chattanooga is contemplated by the Williamsport Wire Rope Co. The company's Chattanooga manager is **R. F. Saunders.**

★ ★ ★

THE American Steel and Wire Co., Worcester, Mass., has purchased 160 hand power cranes, capacity 10 cwt., together with electric hoists for six of their plants, from the Reading Chain and Block Corp.

★ ★ ★

WARREN D. BLATZ, sales manager, and **Walter R. Clark,** works manager, have been elected to the board of directors of the Bridgeport Brass Company.

★ ★ ★

THE Wickwire-Spencer Steel Company has sold its factory property at Union and Summer Streets to the Morgan Construction Company. The plant was used for the manufacture of wire goods before this department was moved to Clinton.

★ ★ ★

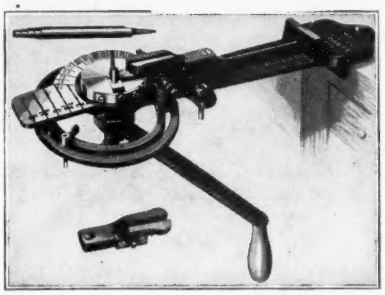
JOHN E. FREDERICK, president of the Kokomo Wire and Steel Company, Kokomo, Ind., has been re-elected president of the Indiana Chamber of Commerce.

★ ★ ★

THE New England Pin Company of Winsted and the Star Pin Company of Derby have been merged and will continue operations in Derby. The combined capitalization of the two companies is $850,000.

★ ★ ★

KILMER WIRE FORMER



Forms Eleven Sizes of Eyes from Flat, Round, Square or Half-Round Stock, also Almost Any Shape Desired

Adjustable for No. 3 to No. 21 Gage Wire

The cut on right shows a few of the thousands of the forms made on this WIRE FORMER

M. D. KILMER & COMPANY
4840 BROOKPARK RD.
CLEVELAND 9, OHIO

SEND IN
YOUR ORDER NOW
FOR THE 1950
WIRE BUYERS GUIDE
to
WIRE & WIRE PRODUCTS
300 MAIN STREET
STAMFORD
CONN.

★ ★ ★

COST: $5.00

JOHN FAHLINE, SR., Sharon, Pa., died at the age of 68. He became associated with John Stevenson, Jr. in 1888, building and operating the rod and wire mills of the New Castle Wire Nail Co. at New Castle, Pa.

★ ★ ★

THEODORE H. WICKWIRE, Chairman of the board of the Wickwire-Spencer Steel Corp., Buffalo, N. Y., died on August 29th. He was born in 1851 and entered the business of manufacturing wire cloth in 1875. In 1907 he organized the Wickwire Steel Company, which was merged with the Clinton-Wright Wire Company in 1920 to form the present corporation.

★ ★ ★

THE New England Butt Company, Providence, R. I., builders of braiding and wire rope machinery, has opened a branch office in Chicago at 140 Dearborn St., in charge of **W. A. Richards.**

★ ★ ★

THE Johnson Steel and Wire Co. has been organized at Worcester, Mass., to manufacture a general line of wires with high carbon steel wires a specialty.

★ ★ ★

CHARLES D. JOHNSON is president and general manager, **G. E. Peace**, assistant general manager; **Bernard A. Johnson**, treasurer; and **George G. Johnson**, assistant treasurer. The Johnsons are the sons of the late Charles O. Johnson, founder of the Worcester Wire Works.

★ ★ ★

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THE Thompson Wire Co., Dorchester, Mass., has filed plans for a one-story addition to cost, with equipment, about $45,000.

★ ★ ★

CLARENCE E. ATKINS has invented and assigned to the **Waterbury - Farrel Foundry and Machine Company** of Waterbury, Conn., a device for wire drawing machinery providing slow starting and gradual acceleration to full speed. This is accomplished by clutches, one for starting and a shifting mechanism for transferring the drive to a fast driven clutch.

★ ★ ★

THE NORTHWEST FENCE and WIRE WORKS, Portland, Oregon, has increased its capital stock from $50,000 to $100,000 to expand its facilities and purchase additional equipment.

★ ★ ★

CHARLES J. KOEBEL and **Frank E. Koebel** have assumed the management and direction of the affairs of the **Balloffet Diamond Wire Dies Co., Inc.** in the United States and Canada with offices and plant at 39 West 2nd St., New York. The company carries a stock of dies ranging from .0044 to .080 inches.

★ ★ ★

EXPANSION in business is provided for by the **Phosphor Bronze Smelting Company,** Philadelphia, Pa., manufacturers of phosphor bronze wire rods and sheet. Four new wire drawing machines have been added, together with other units to increase rod and sheet production, that increase their output by 50 per cent.

★ ★ ★

LINDSAY WIRE WEAVING CO., Cleveland, Ohio, is erecting a two-story addition 50 x 165 feet. H. L. Lindsay is president.

★ ★ ★

ALUMINUM COMPANY OF AMERICA, INC., Pittsburgh, Pa., announces that it is building a one-story wire mill at Massena, N. Y., 150 x 310 feet, to cost an estimated $350,000.

★ ★ ★

WITH a history extending back to 1868, the business of **Thomas Hamilton's Sons and Company,** Philadelphia, Pa., is about to pass into other hands. **Frank M. Hamilton,** head of the firm and son of the founder, after fifty years in the wire industry, plans to retire.

★ ★ ★

LARGER Philadelphia headquarters are planned for the **Star Serv Hanger Co.,** a branch of the **L. A. Young Iudustries,** reputed to be the largest producers of wire springs in the world. The company owns and operates seven plants. The new quarters, which should begin operations in September, are under the management of **J. D. Rice.**

★ ★ ★

THE ADRIAN WIRE FENCE COMPANY, Adrian, Michigan, has taken over the business of the Michigan Wire Fence Company, including the rights, patterns and inventory of the latter's stretcher business.

★ ★ ★

THE HARRISON BOLT AND NUT COMPANY, Harrison, N. J., will erect a warehouse and office building as an extension to its plant. The work will be started August 30th.

★ ★ ★

SLEEPER & HARTLEY, INC., Worcester, Mass. has invented a new wire straightening machine of the type in which the wire passes through a series of alternately off-set dies in a rotating arbor. The device is made in such manner that the need for adjustments is obviated.

★ ★ ★

THE JESCHKE WIRE SPECIALTY WORKS, Crawfordsville, Ind., has been purchased by **Woodard G. Jeschke,** who for the past five years has been manager of the Campbell Wire Specialty Works at South Bend. The Jeschke plant is being moved into new and larger quarters.

★ ★ ★

WILLIAM BROWN GLADDING, vice-president and a director of the **United Wire Supply Company,** New York, for many years a resident of Providence, R. I., died on August 31st at Sorrento, Maine, at the age of seventy-one.

★ ★ ★

GEORGE B. CAVERT, president of the **Cavert Wire Company,** Elwood City, Pa., died on December 15th. He had been identified with the wire industry since early manhood and was a familiar and respected figure in the trade.

★ ★ ★

THE NIAGARA WIRE WEAVING COMPANY, Niagara Falls, Ontario, will build a 110 x 120 foot addition that will be equipped for manufacturing wire cloth screen 270 inches in width for the paper mills of Canada.

★ ★ ★

THE STEEL COMPANY OF CANADA, LTD., Hamilton, Ontario, is installing machinery for the manufacture of chain link fencing that will enable the company to supply types and sizes from ⅜″ to 4″ mesh, using wire varying from 19 gauge to 6 gauge, in widths up to 10 feet.

★ ★ ★

JOHN F. HAZEN has joined the **Bethlehem Steel Company** at Bethlehem, Pa. He will specialize in the sale of wire products. Mr. Hazen was formerly manager of sales of the Pittsburgh Steel Company.

★ ★ ★

WILLIAM L. JONES, president of **Jones & Laughlin Steel Co.,** Pittsburgh, Pa., died on November 25th. He was born in 1863 and succeeded his father to the position of general manager, becoming president of the corporation in 1922.

★ ★ ★

THE WARING WIRE COMPANY, Muskegon, Michigan, with more orders ahead than they can handle and because of continued good prospects, has added 10,000 square feet of manufacturing space to increase its production.

★ ★ ★

A Discussion of Thermoplastics Insulations for Wire and Cable Applications

By James E. Flood, Plant Manager
Plastic Wire and Cable Corporation
Jewett City, Conn.

THE insulating of wire and cable with synthetic resins has expanded considerably during the past several years, both in tonnage of resin produced as well as in scope of products covered. This maturity is shown by the coverage in the entire field of flexible cords, radio, television, communication and construction trades.

★ ★ ★

OF the many thermoplastic compounds and resins available to industry, there are three which have found wide use: plasticized polyvinyl chloride, polyethylene and nylon. Of these three, polyvinyl chloride has proven to be the most versatile and we will discuss its characteristics first.

★ ★ ★

Polyvinyl Chloride

THE polyvinyl chloride resin as supplied by the manufacturer is a white powder of fine particle size. Modification of the resin with other materials is necessary to produce formulas to cover the range of products required. The laboratory development of electrical compounds is a compromise of many properties. It is the compounder's function to balance these properties and arrive at a formula for a given specification. By the conventional internal or open mill mixing, the following essential ingredients become part of the compound.

★ ★ ★

Plasticizer

PLASTICIZERS perform the important function of converting the hard horny polyvinyl chloride resin to a workable elastomeric mass. Most plasticizers are liquids and when added to the resin permit the development of compounds with a wide range of physical characteristics. In the formulating of electrical insulation, a plasticizer is chosen for imparting the following properties to the compound:

1. Electrical properties.
2. Flexibility at both normal and at low temperatures.
3. Permanence of plasticizer which is related to its boiling point and compatibility with the resin.
4. Chemical properties and its effect on metals such as copper.
5. Flame resistance (the plasticizer should not detract from the initial good flame resistance of the resin).
6. Abrasion resistance.

★ ★ ★

THE primary plasticizer may be extended with secondary plasticizers or other modifiers for reasons of economy or to impart some desired property to the compound.

★ ★ ★

PLASTICIZERS which have found general acceptance for polyvinyl chloride in the electrical field are tricresyl phosphate (TCP) and dioctyl phthalate (D.O.P.). Using these two agents alone or in combination with each other and certain modifiers, a wide range of compound properties may be formulated.

★ ★ ★

Stabilizers

DURING processing, vinyl chloride compounds are subjected to high temperatures and this results in the liberation of minute quantities of hydrogen chloride. Although the vinyl resins have excellent thermostability, their temperature range and resistance to decomposition at the high mixing and extruding temperature is greatly extended by addition of stabilizers to act as acceptors of HC1 and for their desired effect on the electrical characteristics.

★ ★ ★

SOME stabilizers which have been found to have the desired combination of properties are basic carbonate white lead, basic silicate white lead and litharge.

JAMES E. FLOOD
Plant Manager Plastic Wire & Cable Corp.

The author graduated from the School of Engineering, Pratt Institute in 1931 with a degree in Chemical Engineering. He worked first in the Works Laboratory of the General Electric Company as Development Chemist on wire and cable products. In 1937 he became Chief Chemist for the Whitney Blake Company in New Haven. In 1942 he joined the Plastic Wire and Cable Corporation as Wire and Cable Engineer and was later made Plant Manager for that company.

Pigments

THE term pigment is used here in a broad sense to include several classes of materials. Fillers are incorporated into the mix to lower material costs and improve extrusion by increasing speed and improving flow and surface. Some useful inert fillers are calcium carbonate, clay and carbon black.

★ ★ ★

LIQUID fillers are used as lubricants, to extend plasticizers and to occupy space without increasing the hardness or detracting from the flexibility. Liquid fillers are of particular value in compounds of high mineral loadings, in that they decrease the amount of absorption of plasticizer by the pigments.

★ ★ ★

COLOR pigments must be carefully selected for their effect on the direct current resistivity and heat and light stability, as well as for their tinctorial power.

★ ★ ★

EXTENDERS are limited in their usefulness in electrical insulation compounds. The butadiene-acrylonitrile polymers have found limited use in this respect.

★ ★ ★

Formulation

TAKING the above factors and incorporating them into a mix, we might arrive at a general recipe as follows:

Polyvinyl Chloride	100.
D. O. P.	30.
T. C. P.	20.
B. C. W. L.	10.
Calcium Carbonate	25.
	185.

★ ★ ★

THE materials are loosely preblended in a tumbler in the order listed and then passed between heated mixing rolls maintained at a predetermined temperature. The mixture is continuously passed through the rolls until sufficient heat is absorbed to flux the plasticizer and resin forming a workable sheet that can be cut back and forth to develop a homogeneous mixture.

★ ★ ★

AN internal mixer accomplishes the same end. The tumbled preblend is fed into the mixer, where it is fluxed between revolving blades and then fed to a two-roll mill for further working.

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THE temperature of the mixing rolls is maintained at 260° Fahrenheit to 300° Fahrenheit and is adjusted up or down for the individual compounds.

★ ★ ★

ON completion of the mixing, the mill is stripped by sheeting onto a conveyor where the compound is partially hardened by cooling as it is carried to the granulator, which cuts it into ¼" to 3/16" pellets suitable for storage and extrusion.

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Extrusion

THE insulating of wire and cable with thermoplastic materials is characterized by the same extrusion principles used in this industry for some years.

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REFINEMENTS in equipment and improvements in technique have effected a fundamental improvement in handling. In the early stages the compound was cut from the warming mill and fed to the extruder hot. As improvements in the means of heat transfer and the extension of the screw and sleeve were made, it was found that strips could be fed at room temperature with great convenience in inventory and storage. Later the granulated material found favor in that it fed easily, improved extrusion and was more easily stored and transported.

★ ★ ★

AN extruder is composed of a screw or, as more commonly called a worm, revolving in a close fitting sleeve. The sleeve is encased in a barrel containing the heating medium. In the more modern machines this is electrical resistance units, but circulating oil and steam are still in wide use.

★ ★ ★

AT the screw end, allowance is made for a breaker plate and wire screens packs which check the flow of plastic to build up pressure prior to its entering the head which holds the insulating die and the guide tip which insures the proper concentricity of the insulation around the conductor.

★ ★ ★

THE extruder is divided into zones for the step control of temperature. In some types, the feed throat is water-cooled to carry off heat which may cause the granules to bridge by partial melting and thus to shut off the flow into the worm. Other zones are the cylinder, breaker plate and head, which are individually controlled. The temperature is graduated to a high point at the head.

★ ★ ★

THE granules are fed from a supply hopper into the throat, where they are picked up by the screw, which has a decrease in pitch from the feed end to the die end. This develops greater and more constant pressure than if a screw of constant pitch were used. The plasticizing is accomplished by the frictional forces of the revolving worm forcing the granules against the walls of the sleeve. A very close tolerance of between 0.010 to 0.005 inches is maintained between the screw and sleeve. As the granules pass through the extruder the plasticity becomes a function of friction and transfer heat. Because of the pressure and mastication, certain strains are set up in the compound. The function of the breaker plate, which is a flat piece of cold rolled steel between ½" and ¾" thick, in which tapered holes between 1/8" to ¼" are drilled in sufficient quantity to allow free passage of the compound, is to check the irregularity of flow of the material and cause it to flow evenly to the cavity in the head, surrounding the tip, wire and die. The breaker plate as a rule backs up fine mesh screens, which also serve to smooth out the flow, break up lumps and act as a general sieve to prevent foreign particles from passing through

onto the wire. By careful regulation of the temperature in the various zones, as experimentally determined for each compound, the material at the forming die will have the necessary plasticity to take its shape and flow uniformly around the conductor.

★ ★ ★

THE rate of movement of the compound through the extruder is dependent on the rotational speed of the worm, the temperature of the zones and the nature of the compound. In the extrusion of thermoplastics, care must be exercised not to use excessive temperatures to permit higher worm speeds as a means of forcing more rapid production. Overheating may cause partial decomposition, which may result in inferior insulation due to porosity, strains and poor physical properties. For the extrusion of polyvinyl chloride, temperatures graduating from 200° to 220° Fahrenheit at the throat to 300°-380° Fahrenheit at the head will cover a wide range of formulas.

★ ★ ★

IN the extrusion of wire it is important to maintain a uniform diameter, with the conductor well centered. This is accomplished by a balance between the worm speed, zone temperatures, die design and the rate at which the conductor passes through the head carrying the insulation with it.

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AS the hot plastic is carried from the extruder around the conductor, it is allowed free passage in air between 3.0 to 4.0 feet to allow partial cooling and hardening and then passes into cooling water flowing counter-current to the wire. The insulation is thereby hardened enough to be wound on the capstan and onto the take-up reels without deformation. The temperature of the cooling water is maintained between 50° and 60° Fahrenheit and the speed of production and the thickness of the insulation will influence this factor.

★ ★ ★

IT is customary in some types of insulation to anneal or flame-polish to remove strains. This is accomplished by playing a direct flame on the passing insulation or running it through an electrically-heated furnace just after leaving the insulating die.

★ ★ ★

Polyethylene

POLYETHYLENE was first introduced to the wire and cable industry in 1943. Its advent at that time fulfilled an urgent need in the design of low-loss dielectric materials in radar and high-frequency cables needed in the war effort.

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SINCE the war, polyethylene has found a wide field in the insulating of ultra-high-frequency cables, power cables, television lead-in and assemblies, multiconductor cables for control and signal systems, and telephone cables.

★ ★ ★

IN polyethylene we have an insulating material that is inert to practically all types of chemicals at room temperature, retains a dielectric constant of 2.3 and a power factor of 0.0003 over a frequency range of 60 cycles to 50 megacycles, and flexibility maintained to below minus 70 degrees centigrade.

★ ★ ★

Compounding

POLYETHYLENE as supplied by the manufacturer is suitable for extrusion without any further compounding. There are added during manufacture, however, certain age resistant agents to provide light and heat-stability. These, in addition to color pigments which may be added by the resin manufacturer or the wire processor, are the only additions to resin.

★ ★ ★

CONSIDERABLE study has been made of the modification of polyethylene with other agents. The general incompatibility of polyethylene with other materials makes attempts in this direction merely physical dispersions. On the other hand, the addition of other ingredients does not improve the usefulness of the resin as electrical insulation.

Extrusion

THE principals of extrusion discussed under polyvinyl chloride hold true for polyethylene with minor differences. Insulating dies with long tapered lands have been found to iron out the plastic during extrusion and to yield more uniform dimensions and smoother surface. In many cases the conventional die design used with polyvinyl chloride can be successfully used with polyethylene.

★ ★ ★

THE cooling of polyethylene to harden the insulation is obtained by the counter-current flow of warm water. The use of warm water has proven beneficial in reducing strains and eliminating air gaps between the conductor and insulation due to too rapid cooling.

★ ★ ★

EXTRUSION temperatures for polyethylene are in the range of 300 degrees Fahrenheit to 450 degrees Fahrenheit.

★ ★ ★

Nylon

NYLON'S principal function in the wire and cable industry is as a protective jacket. It has found considerable favor in this field, principally because of its excellent abrasion resistance and high film strength in thin-wall applications. Other important properties contributing to its usefulness are its stability at high temperature, flexibility at low temperature and chemical resistance.

★ ★ ★

NYLON is a generic term for a family of long chain synthetic polymeric amides which are thermoplastic and shaped by extrusion, injection molding and spinning into threads or filaments.

★ ★ ★

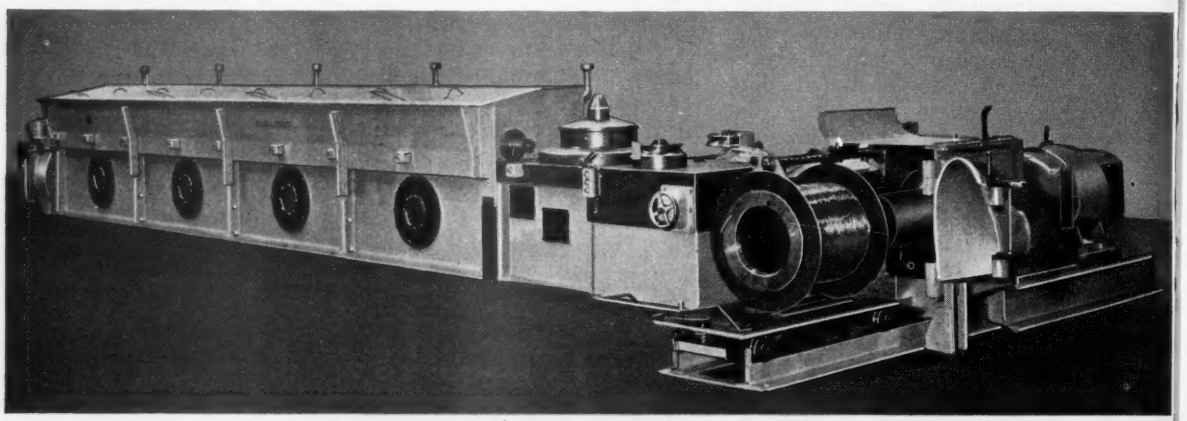
Compounding

NYLON compounds are supplied to the wire manufacturer al-

New HIGH SPEEDS ind

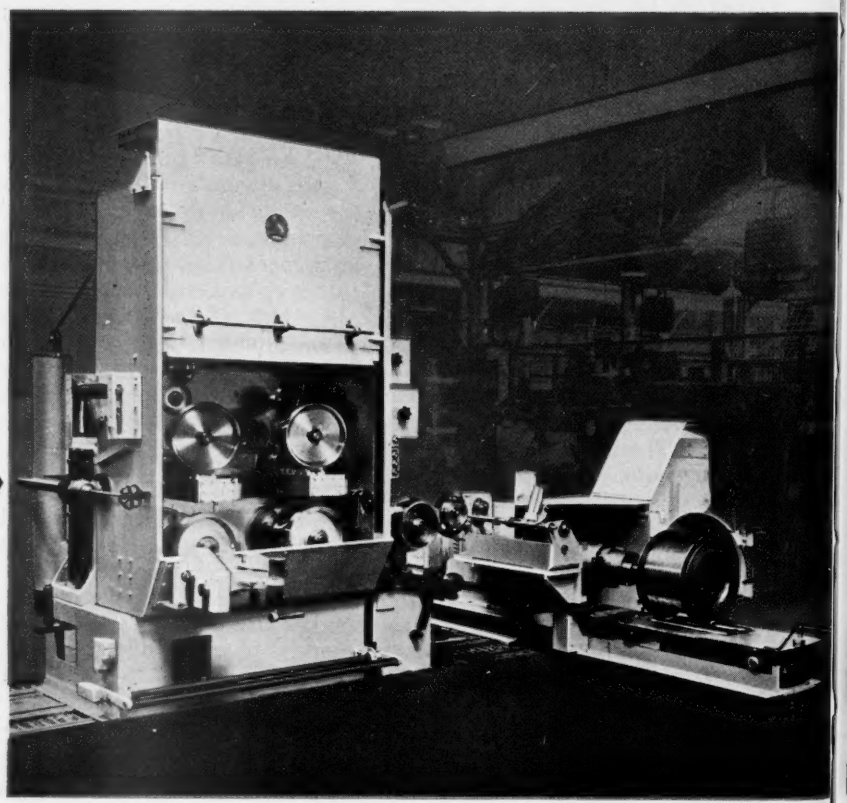
Now a new line of Marshall Richards equipment to slash your production costs!

THESE THREE Marshall Richards machines are brand new to the United States but have already proved their outstanding merit in leading European wire drawing plants. Between them, these machines cover the full drawing range from copper rods and intermediate wire sizes to fine wire. All of them set completely new highs in drawing speeds . . . and all have special design features that assure utmost efficiency, exceptionally economical operation, and wire of unsurpassed, uniform quality.



TANDEM COPPER ROD MACHINE—4000 FT./MIN.

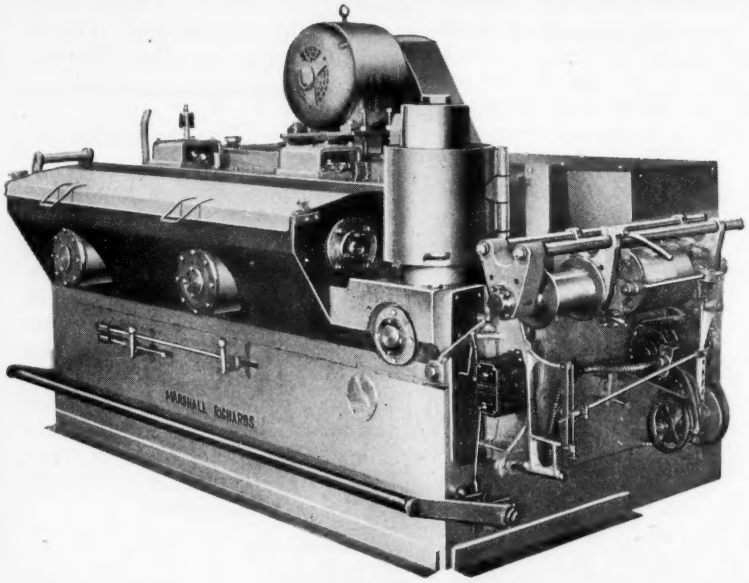
This new Marshall Richards Tandem Type Rod Machine has *vertical* capstans so that both dies and driving spindles are completely submerged in liquor. Powerful jets of liquor are also directed into the entrance cone of each of its 7 (or 9 or 11) dies. These features bring longer die life and superior wire quality . . . permit faster speeds. The standard electric spooler has a capacity up to 2000 lbs.



INTERMEDIATE WIRE DRAWING MACHINE—6000 FT./MIN.

New Marshall Richards Type 13H is a spray and jet lubricated machine for drawing the intermediate sizes of wire. Four cones with six steps each draw wire through 13 dies to a maximum diameter of .056" at 3500 ft./min. Finer wires are finished at speeds up to 6000 ft./min. The electric spooler has a capacity of 1000 lbs.

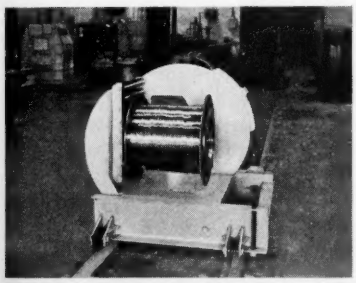
drawing copper wire



FINE WIRE DRAWING MACHINE—8000 FT./MIN.

The new Marshall Richards Type FS.4 is designed to draw wire to 40 B&S. It is a 4-cone machine using from 9 to 21 dies. Both the cones and dies are completely submerged in liquor. It features the famous Marshall Richards Magnetic Spooler which has a capacity up to 40 lbs.

The rugged construction, perfection of materials and workmanship in Marshall Richards wire drawing machines add up to extra long and trouble-free working life. In addition, every detail of design in these machines has been adopted as the result of demonstrated superiority under all conditions of service.



Spool is unloaded by means of a trolley running on rails integral with the steel frame of the Rod-Machine and requiring no lining up on the site. Trolley has a spool tilting device which facilitates unloading, removes danger of damage to spool and minimizes the possibility of industrial accidents.

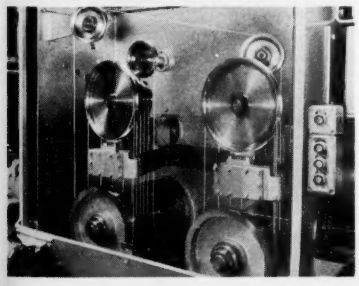
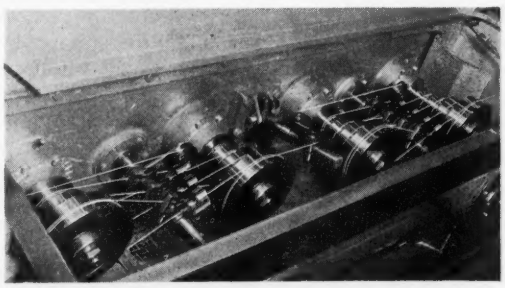


Illustration of capstans and methods of threading on the Marshall Richards Type 13H machine for intermediate-size wires. Steps on cones are in the form of slabs and can be changed separately . . . Wire passes vertically through dies from one step to the next over large-diameter pulleys.



Drawing cones and threading-up method on Marshall Richards Type FS.4 machine. The four drawing cones are arranged in line and are threaded by our patented "Figure 8" system which brings the advantage of no idle cones. Threading is simplified as the operator does not have to pass wire underneath the die holders.

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D R A W O N O U R E X P E R I E N C E

ready compounded for a specific application. For example, in the wire and cable field, nylon is used almost exclusively as a protective jacket over polyethylene and polyvinyl chloride in telephone and similar cables. Here its smoothness and toughness combined with lightweight make it an ideal protective sheath. The nylon is received from the manufacturer completely dry in hermetically sealed metal containers. For the best results, nylon must be extruded completely dry. Nylon is not outstanding in its electrical properties and has found only limited use as a primary insulation.

★ ★ ★

Extrusion

THE nylon compounds used in wire coatings are of a relatively high melting point. For best extrusion results, some changes are recommended in the design of the screw, guide tip and die, screen pack and temperature controls.

★ ★ ★

A SCREW in which the flights are of uniform pitch with decreasing depths has worked out well. The depths of the flights are considerably less than in the worms used for polyethylene and polyvinyl chloride. This is necessary because of the higher melting point and natural toughness of nylon which makes plasticizing by heat-transfer and friction a slower process than with polyvinyl chloride and polyethylene. In the passage through the extruder, temperature control is of prime importance to ensure delivery to the screen pack and breaker plate of a plastic mass uniform in plasticity and temperature. Properly plasticized nylon is quite liquid and flows freely. Extrusion temperatures are maintained between 400° and 600° and will be dependent on the particular compound. The temperatures are graduated from a water-cooled feed throat to the die temperature found suitable for maintaining good extrusion.

★ ★ ★

THE breaker plate and screen pack are similar to those used for thermoplastics except that much finer screens are employed, down to 120 mesh, and more of them. This is necessary to ensure uniform plasticizing by breaking up unmelted lumps and to maintain uniform pressure in the head, as nylon changes from a solid to a liquid state very rapidly.

★ ★ ★

IN the extrusion of nylon, the principal difference from the other thermoplastics discussed is that it is not forced around the conductor but rather drawn around the conductor. To accomplish this, the guide tip extends into the die opening the full length of the die, the end of the guide tip being flush with the end of the die. The clearance of approximately four times the desired wall thickness is maintained between the die land and the guide tip. By this means, a tube of nylon is extruded over the conductor and the nylon in nearly liquid condition adheres to the passing conductor, which travels at a higher rate than the speed at which the nylon tube is extruded. In this manner, the tube is drawn down in the form of a cone, with its wall thickness reduced in proportion to the speed of the wire. A slight vacuum is maintained at the guide tip to hold the cone uniform and to draw the concentric tube of nylon into close contact with the conductor. This vacuum also aids in collapsing the tube and expelling trapped air. The thickness of the nylon being applied is dependent on the speed in which the conductor travels in drawing down the cone and the rate of delivery of nylon to the wire. As soon as practicable after leaving the die, the nylon coated wire is immersed in water for cooling. This cooling may be accelerated or delayed by controlling the temperature of the water. In most other respects, the extrusion of nylon is handled similar to other thermoplastics.

★ ★ ★

Conclusion

THE purpose of this paper has been to familiarize those not directly connected with the insulated wire field with the role thermoplastic resins are serving in electrical insulation. The paper has been limited to the three resins in general use today. It must not be concluded from this discussion that the field is limited to these resins as there are other thermoplastics having limited or specific uses for wire insulation.

★ ★ ★

THERE are indications that the trend in the insulated wire industry is towards the increased use of thermoplastics. These resins will continue to replace other insulating materials wherever they demonstrate their superior properties and make possible the design of wire and cable constructions heretofore not practical. This is demonstrated in the progress made in the radio, television and communication fields.

★ ★ ★

THANKS and credit are extended to the technical service staffs of the E. I. du Pont de Nemours & Co., Polychemicals Division and the B. F. Goodrich Chemical Company, Plastic Materials Department for their proofreading and helpful suggestions.

TO WIRE MILL MEN

Have you considered joining the Wire Association? You are cordially invited to become a member. Dues are $15.00 a year, which includes a subscription to WIRE & WIRE PRODUCTS and a copy of the Annual Buyers Guide.

300 MAIN STREET THE WIRE ASSOCIATION STAMFORD, CONN.

An Investigation Of The Weavability Of Wire With Observations On The Defects Of Wire And Wire Cloth

By Walston Chubb, Jr.

Perrysburg, Ohio

Summary and Conclusions

Conclusions

1.) The literature with regard to the problems of the wire weaving industry is very meager indeed. Science has made very little progress in its invasion of the art of wire weaving.

★ ★ ★

2.) Many methods of testing wire are known, but most of these tests are purely empirical tests developed for testing wire for specific uses; uses that have no relation to the weaving of wire. Only a very few tests are suitable for testing properties related to the weavability of wire.

★ ★ ★

3.) Weavability has been defined in an effort to discover and isolate those mechanical properties that determine the ability of wire to be fabricated into wire cloth.

★ ★ ★

4.) The transverse-crimp-sensitivity test has been developed from an artisans qualitative test into a quantitative scientific tool. The test has proved to be a simple, direct method for determining the workability of wires of many sizes, grades, and compositions. Results of the test have been completely substantiated by tensile, hardness, and metallographic data, as well as by actual production data. It has been an invaluable tool in the laboratory for distinguishing between wires of superior and inferior weavability. The author believes that the test gives a dependable measure of the weavability of wire. The transverse-crimp-sensitivity test is able to detect very small variations in stiffness that would usually be overlooked by the tensile test which requires a comparatively long wire specimen. As an inexpensive, rapid, and dependable test for the investigation of weaving wire the value of the transverse-crimp-sensitivity test can no longer be seriously questioned.

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5.) Incomplete or improper annealing of wire has been shown to be the most important cause of non-uniformity and "hardness" of annealed steel weaving wire. The workability and stiffness of such wire has been shown to vary drastically from point to point.

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6.) Segregation has been shown to be another cause of "spottiness" or non-uniformity of annealed steel weaving wire.

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Part IV

This study is the result of research work carried on at the Missouri School of Mines and Metallurgy under the Ludlow-Saylor Wire Company's research fellowship there, now in its third year. The object of the fellowship is to enable suppliers to furnish better wire and wire cloth buyers to secure the highest quality of product. The first fellow was C. W. F. Funk, whose work is referred to by the author and from whose researches he benefited. The work was carried on under the direction of Dr. E. S. Epplesheimer, professor of Metallurgical Engineering, co-author of the paper. This paper is being published in four installments of which this is the fourth and last part.

7.) Specifications for weaving wire have been sadly neglected. It is possible that some are incorrect and even the best are incomplete by modern standards.

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Summary

THE literature with regard to the manufacturer and testing of wire and wire cloth plus some information from the author's own experiences have been reviewed in an effort to describe the point of departure for this year's investigations. The production of wire, the testing of wire, and the manufacture of wire cloth have been briefly discussed. References to more detailed discussions have been given wherever possible. Some of the defects of wire cloth have been described; and theories for the origin of these defects have been offered for what they're worth. The concept of "weavability" has been presented, and has been described by the author as the ability of wire to be fabricated into wire cloth.

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THE various physical tests that are applicable to weaving wire have been described and their use discussed. The invention, the development, the theoretical concepts behind, and the procedure for using the transverse-crimp-sensitivity test have been described in detail.

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SOME of the defects that occur in wire have been presented and those that occur most frequently in weaving wire have been described with regard to their effect upon the weaving operation. The data from the investigation of eight cases of wire of unsatisfactory weavability have been presented, and in each case the author has given an opinion as to the cause of the unsatisfactory behavior. Weaving wire specifications have been reviewed, and it has been suggested that further work be done to improve these specifications.

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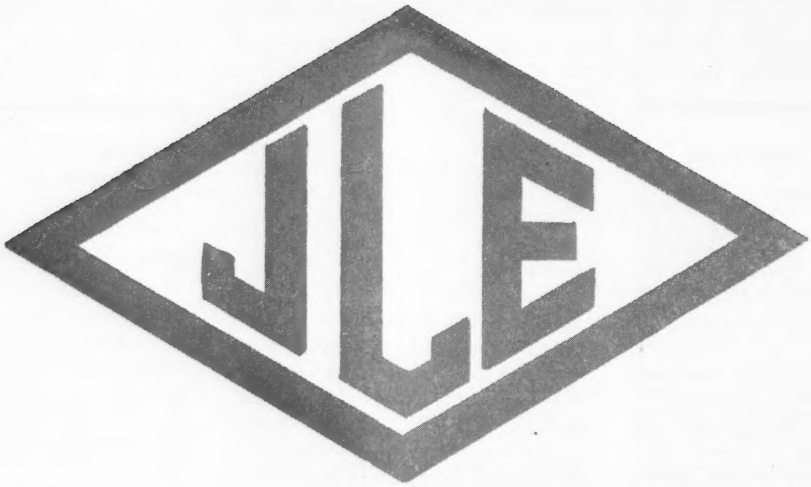
Suggestions for Further Work

FOR the benefit of subsequent investigators, the author would like to give a few suggestions for further work. One need only glance through the work of the past two years and ask the questions, "How?", and "How much?", in order to find problems requiring further study; and the following are just a few that have occurred to the author:

a.) Finding some means for removing the "ripple in filter cloth" is probably the most important thing that Ludlow-Saylor desires to accomplish by means of the fellowship with regard to improving their products.



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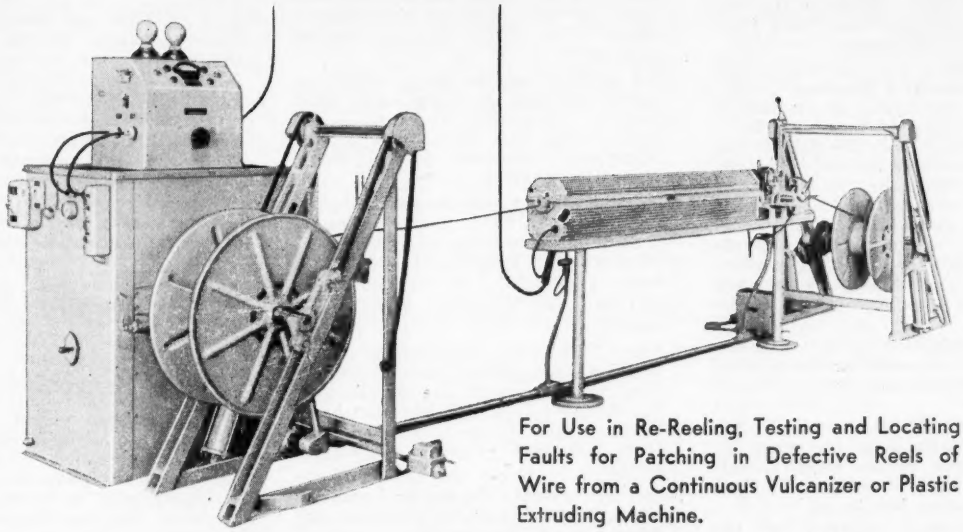

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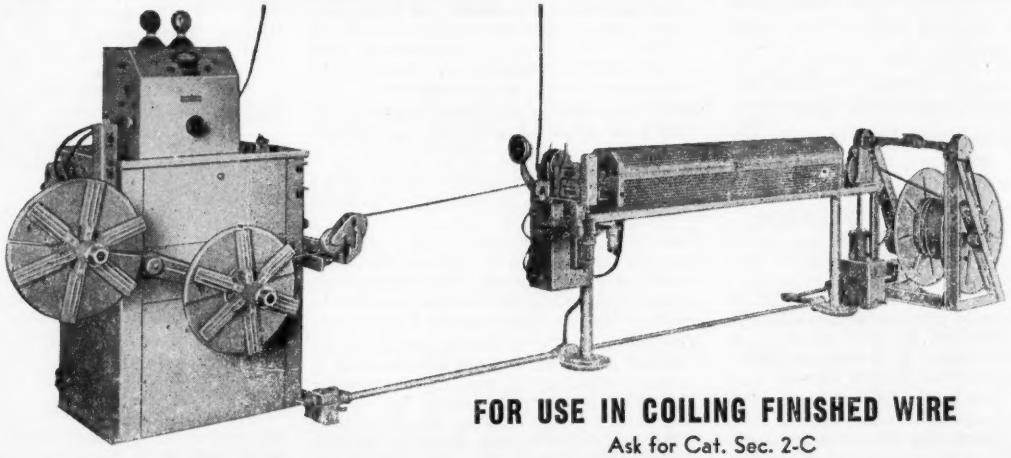

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b.) Setting up rigid specifications for weaving wire is probably the most important thing that Ludlow-Saylor desires to accomplish with regard to improving the quality and uniformity of their raw materials.

c.) The causes of brittleness in hard drawn, high carbon steel weaving wire is another problem suitable for investigation in this type of research program.

d.) Perhaps at some time in the future Ludlow-Saylor may desire to obtain data on flow rates and particle size retention for wire filter cloth, similar to the data obtained by Michigan Wire Cloth Company for their customers.

e.) Now that a test for weavability has been developed, a thorough investigation of the importance of the various defects of all types of weaving wire is not out of order. Even the field of low carbon, annealed wire has not been completely exhausted; the author has a suspicion that perhaps one or two cases of faulty wire which he ascribed to poor annealing may be cases where segregation has retarded the annealing process. If so, then this effect may be very important in the future and will require careful study.

f.) An investigation of the wear resistance of wire screens for the mineral dressing industry might prove to be of great value,(37).

g.) The causes of defects in wire cloth should be a fertile field for many investigations; the causes cited in this paper are in many cases just the best guesses the author has heard.

h.) A theoretical analysis of the forces involved in crimping and in weaving might be undertaken. A study of the cold working of metal during crimping might be combined with this study. Such an investigation might lead to a more concrete concept of weavability and to more rigid specifications for weaving wire.

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THE author believes that his success in his work this year has been largely the result of his opportunity to become familiar with the processes at Ludlow-Saylor Wire Company in the summer of 1948. It is hoped that future investigators will have the advantage of this sort of experience.

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Glossary

ANNEALING is a process by which a metal is heated and cooled to soften it. Steel is annealed by heating it to a temperature above 1350 degrees Fahrenheit and cooling it very slowly.

BEATER: The beater is that part of a wire weaving loom that carries the reed and forces the fill wires into the cloth.

BOBBIN: A bobbin is a spool or reel upon which wire or thread is wound.

CLOTH is a pliable fabric, woven, felted, or knitted from any filament or thread-like material.

CRIMPING is a process of folding or plaiting or bending a wire into small regular undulations, wrinkles, or frills. It may be accomplished by passing a wire through a system of gears.

CRITICAL RANGE: The critical range for steel is that interval of temperature within which iron changes from one form into another; it is usually considered to be between 1350 and 1500 degrees Fahrenheit.

DUCTILITY is the ability of a material to be elongated by tensile forces without breaking.

ELASTIC LIMIT: The elastic limit is the maximum stress that a material will stand without deforming permanently. It marks the end of the elastic range and the beginning of the plastic range. It is almost the same as the yield point.

FILL WIRES are the wires which are passed through the warp wires when cloth is fabricated. These wires are often called the "shoot" or "shute" wires and correspond to the "woof" in textile weaving.

FLAT WIRE is a cold drawn metal object having a width greater than its thickness; the maximum width of flat wire does not usually exceed one-half inch.

GRAINS are individual crystals in metals.

HARDNESS is the resistance of a material to scratching, indentation, or bending. As used by the metallurgist, "hardness" refers to indentation hardness; as used by the wire weaver the term "hardness" refers to stiffness or temper.

HEDDLES are the frames or harnesses which move the warp wires up and down during the weaving of cloth.

MESH refers to the openings or spaces between successive wires of a screen or cloth. The number of openings per inch in a screen is known as its mesh count.

NITOL is a mixture of nitric acid and alcohol. Two percent nitol contains two percent nitric acid.

PATENTING is a heat treatment operation applied to medium and high carbon steels: the metal is heated to about 1500 degrees Fahrenheit and then rapidly cooled in air or lead to produce a very fine structure.

PIRN: A pirn is a swordshaped device used in place of a bobbin on shuttle type, wire weaving looms.

PLASTICITY is the ability of a material to be deformed permanently without breaking.

PROCESS ANNEALING is an operation applied to metals to soften them for further cold working. Process annealing of steel involves heating it to about 1000 or 1200 degrees Fahrenheit.

RECRYSTALLIZATION is a process by which a distorted grain structure of a cold worked metal may be replaced by a new undistorted, strain free grain structure. This process requires that the metal be heated above a certain minimum temperature.

REED: The reed is the slotted portion of the beater through which the warp wires pass. There must be a separate slot for every warp wire so as to space the warp wires properly in the cloth.

SCREEN: A screen or sieve is a perforated plate or woven wire fabric or other device with regularly spaced apertures of uniform size, mounted in a suitable frame or holder, for use in separating coarse particles from fine particles.

SEGREGATION is the phenomenon of concentration of alloying elements in one section of an alloy such as steel.

SHAPED WIRE is a cold drawn wire of any irregular or symmetrical cross section.

SHUTTLE: The shuttle is that device used in weaving for carrying the bobbin and fill wire through the warp wires.

WARP WIRES are those wires in a fabric which extend lengthwise through the loom during the weaving process. These wires must be threaded through the heddles and reed before weaving can commence.

WEAVABILITY is that group of characteristics that determine the ease with which a wire may be fabricated into cloth.

WIRE is a metal object in the form of a filament, thread, or slender rod.

WOOD'S METAL is an alloy of bismuth, cadmium, lead, and tin that melts below the boiling point of water.

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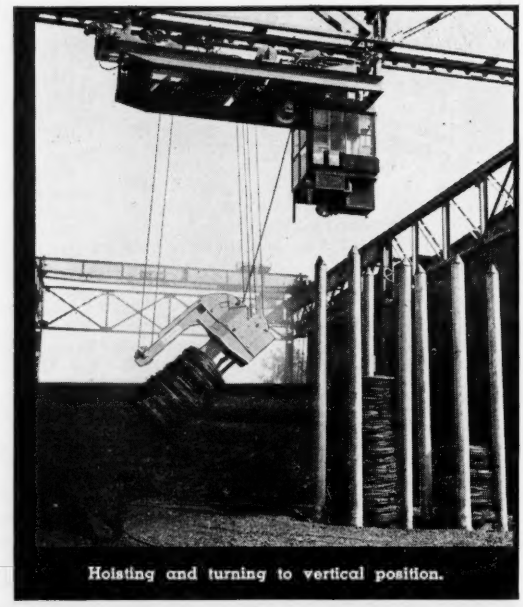

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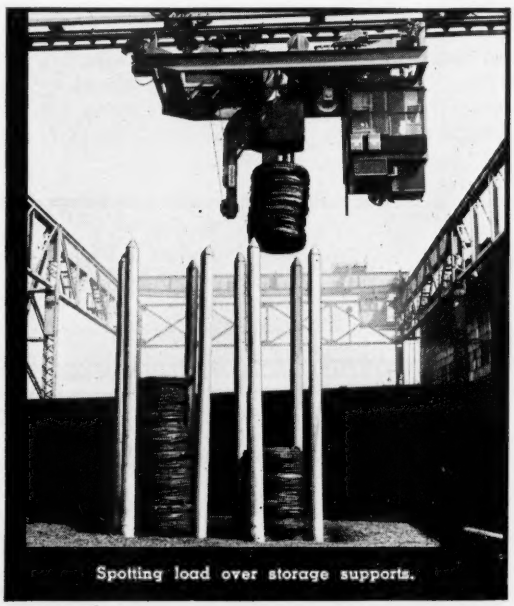
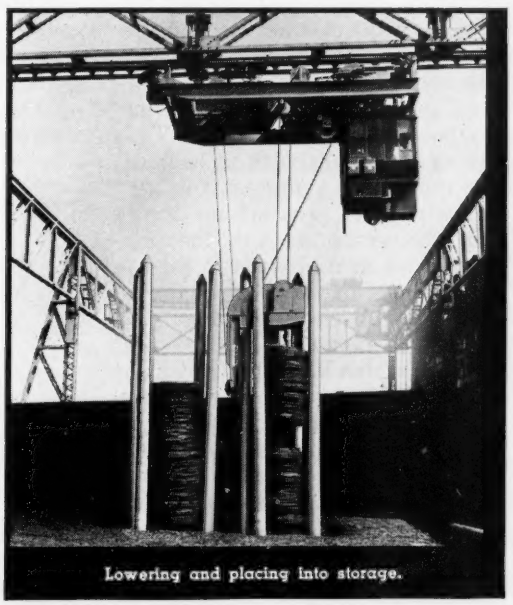


Spotting load over storage supports.



Lowering and placing into storage.

Drag-out Losses in Wire Plating

Part I

By Joseph B. Kushner, Ch.E.
Consulting Electroplating Engineer
Stroudsburg, Pa.

This article is primarily concerned with the losses that arise in plating with precious metals. It will be published in three parts: Part I, Determination Drag-Out and Liquid Film Thickness; Part II, Ways and Means of Reducing Drag-Out Losses; and Part III, Use of Recovery Rinse Baths in Plating. This paper is Part I.

Determination of Drag-out and Liquid Film Thickness

THE subject of drag-out, in connection with wire plating, is of considerable interest, particularly where precious metals such as gold and silver are being plated out. Drag-out is the thin liquid film that clings to a wire as it emerges from the plating bath. This liquid film is the plating bath itself and when the wire plating process is in continual operation, we can consider drag-out as the flow of the plating bath through a very small pipe annulus in which the diameter of the inner pipe is the diameter of the wire being plated and the diameter of the outer pipe is the wire diameter plus two times the thickness of the liquid film, as illustrated in fig. 1. The velocity of liquid flow through this annulus is obviously the velocity of the moving wire itself.

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THE amount of plating bath lost this way, can be much larger than is ordinarly suspected and can be the cause of excessive operating costs where wires are being gold plated, for example. Thus the writer recalls with amusement one gold plating process for very fine wires that was set up during the war years by two inexperienced wire men anxious to cash in on the demand for this type of material. A check of their particular arrangement showed that more gold was being lost down the drain as drag-out than was actually being plated on the wires! Such a case is exceptional, of course. There are ways and means of reducing these drag-out losses to a minimum amount, as will be indicated in another paper on this subject. Nevertheless, an isolated case of this type definitely points the need for determining and controlling drag-out losses.

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PROBABLY the simplest and best method for determining the drag-out loss and the liquid film thickness, is based on the following analysis:

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CONSIDER the wire plating tank and the running rinse tank schematically indicated in fig. 2. Assuming the wire is moving at a constant velocity, v ft./min. and that the concentration of salts in the plating bath is kept constant at a value C_0 ounces per gal. then the total amount of material that is being carried out of the plating bath per minute is equal to $7.5AvC_0$, where A is the area of the annulus in sq. ft. and 7.5 is the factor for converting cubic ft. to gallons.

★ ★ ★

THIS material on entering the running rinse tank, is assumed to mix completely with the water in the tank during the period of immersion and the mixed diluted solution leaves the rinse tank in two ways: 1) As waste water flowing out of the tank at the rate of Q gallons per minute (gpm). 2) As drag-out on the wire.

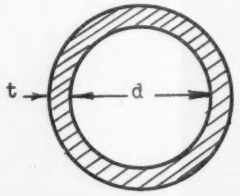
★ ★ ★

WITH water flowing in and out of the rinse tank at a constant rate soon an equilibrium is reached in which the solid material carried into the tank is being carried out at the same rate. This being so, we can state as a material balance over the system, that

1) $$7.5\,AvC_0 = QC_r + 7.5\,A_1 v C_r$$

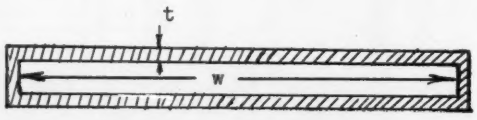
where C_R is the equilibrium concentration of the plating salts in the rinse tank and A_1 is the area of the liquid annulus leaving the rinse tank. (A_1 is usually taken to be equal to A but is actually somewhat smaller due to the decreased

Fig. 1



Drag-out film on wire

Fig. 2



Drag-out film on strip

viscosity of the diluted solution.)

★ ★ ★

Rearranging 1) gives

2)

$$\frac{7.5 A v}{Q + 7.5 A_1 v} = \frac{C_r}{C_o}$$

Since the second term in the denominator on the left is very small as compared to Q, we can neglect it entirely. If this is done and we solve the equation for A, we get:

3)

$$A = \frac{Q C_r}{7.5 v C_o}$$

★ ★ ★

THE area of an annulus as given in any geometry text is equal to

$$\frac{\pi}{4}\left[(d + 2t)^2 - d^2\right]$$

where d is the diameter of the inner circle and t is the thickness of the annulus, in consistent units of measurement. If this expression is factored we get the area of the annulus is equal to

$$\pi(t^2 + td)$$

This being so, we can set the last expression equal to the value we got for A previously and get as a result,

4)

$$\pi\left(t^2 + td\right) = \frac{Q C_r}{7.5 v C_o}$$

★ ★ ★

THIS regular quadratic equation in t can be readily solved by the standard method to give

5)

$$t = -d + \sqrt{d^2 + \frac{4 Q C_x}{\pi 7.5 v C_o}}$$

★ ★ ★

IF the d^2 is factored out of the quantity under the square root sign, we can rearrange the answer as

6)

$$t = -d + d\left(1 \frac{+4 Q C_x}{\pi d^2 7.5 v C_o}\right)^{\frac{1}{2}}$$

★ ★ ★

THE last term in the parentheses is very small as compared to unity so we can approximate the whole expression using the Binomial Theorem as

$$d\left(1 + \frac{2 Q C_x}{\pi d^2 7.5 v C_o}\right)$$

and if this is done and the subtraction carried out we get as a final result,

7)

$$t = \frac{2 Q C_x}{\pi 7.5 v d C_o}$$

This is the equation that gives the thickness of the drag-out film in ft.

★ ★ ★

ACCORDING to this then, in order to determine the film thickness and/or the drag-out loss, we have to know the velocity at which the wire is moving, the diameter of the wire, the rate at which the rinse water is running and the concentration of salts in both the plating bath and the rinse tank.

★ ★ ★

THE rinse water flow can be controlled for the purposes of a test by means of a very simple and inexpensive device called a "Mesureflow" or by controlling a valve using a flowmeter as a guide. The concentration of salts in the rinse tank can be determined by analysis but a far more expedient and simple method for obtaining the ratio C / C_0 is the following: With the wire plating process in operation insert the conductivity cell of an inexpensive water quality tester in the rinse tank. Soon as a steady reading is obtained, note the reading on the dial. Now with a pipette remove exactly 1 cc of the plating bath and place in a clean, dry beaker about 4 liters in size. To this beaker add measured amounts of tap water at the same temperature used for rinsing, stirring with a glass rod and taking an occasional reading on the water tester until exactly the same reading on the dial is obtained as was gotten in the rinse tank. At this point, 1 over the volume of water added to the beaker, in ccs., is equal to the ratio C_R/C_0.

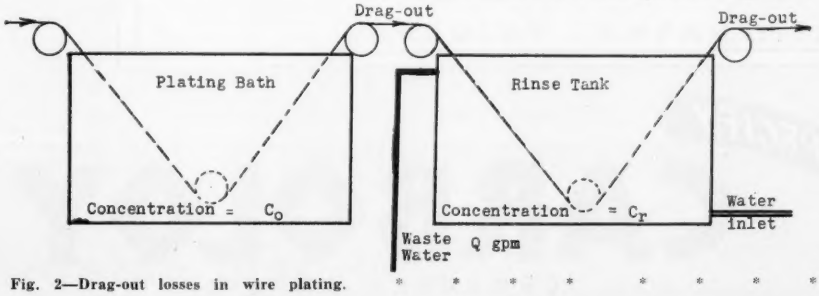


Fig. 2—Drag-out losses in wire plating.

★ ★ ★

Some Practical Examples

WIRES (24), are being plated in a gold solution in which the gold content is .25 oz. per gal. The wires move with a velocity of 100 ft. per minute and are .001" in diameter. No recovery rinse is being used and rinse water flows into the rinse tank at a rate of 2 gallons per minute. A dilution test shows the ratio C_R/C_0 to be equal to 1/2500. How much gold is being lost in an 8-hour working day through drag-out?

★ ★ ★

THE total volume of drag-out loss in gallons per minute, according to equation (3) is equal to QC_R. Using the figures just given, $\frac{C_R}{C_0}$ the total drag-out in gallons per minute is equal to

$$\frac{2 \times 1}{2500} = .0008 \text{ gpm.}$$

★ ★ ★

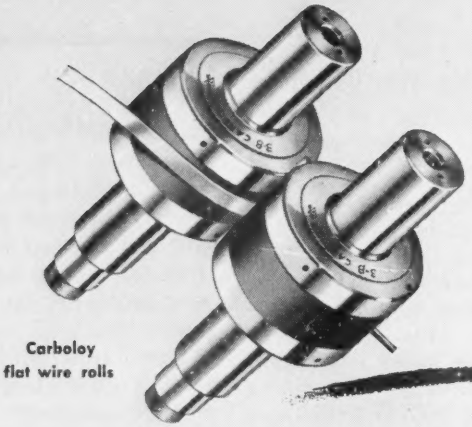
OPERATING 8 hours a day the total loss in gallons is $480 \times .0008 = .384$ gallons. A gallon of plating solution contains .25 oz. of gold is worth approximately $9, therefore, the daily loss in dollars is $3.46 and over a year period it amounts to over $1000!

★ ★ ★

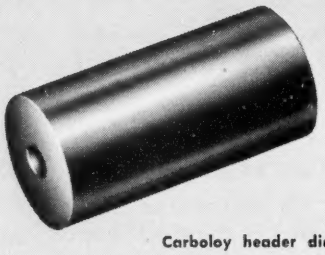
IN a high speed zinc plating line running 100 wires of .025" diameter at a speed of 300 ft. per minute it is desired to know the drag-out film thickness. Rinse water is flowing at 5 gpm and a dilution test shows a ratio of 1/500. What is the thickness of the liquid film?

★ ★ ★

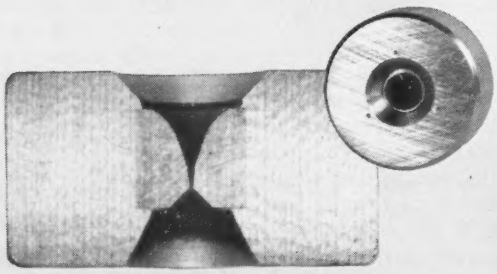
CARBOLOY



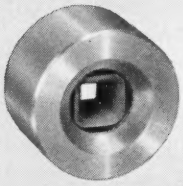
Carboloy flat wire rolls



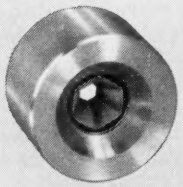
Carboloy header die nib—now in stock



Carboloy R Series die



Carboloy square die



Carboloy hex die

These wire dies—square, hex and R Series, plus flat rolls and header nibs—are representative of the matchless products which bear the Carboloy name. Each one is backed by years of unexcelled carbide engineering and research. Their performance, like that of any Carboloy die, will bring longer life, increased production and lowered production costs to your wire operations.

PROTECT YOUR DIE INVESTMENT

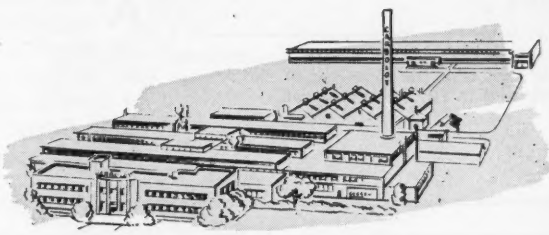
SPECIFY **CARBOLOY®**

CEMENTED CARBIDE

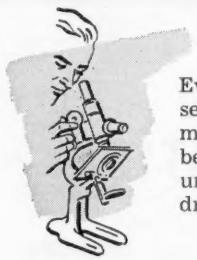
top-quality dies for top-quality performance

REPUTATION depends upon performance. Carboloy's reputation, tops in the cemented carbide field, is based upon almost twenty-five years of outstanding product performance and service.

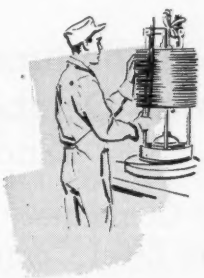
For Carboloy wire and tube drawing dies offer you consistently high standards of uniform quality, uniform performance and uniform dependability. Here's how these standards are maintained, and what they mean to you:



The world's finest cemented carbide production facilities, guided by the most complete staff of carbide engineers in the country, assure unexcelled carbide products. You know the name, and you know you can benefit with Carboloy dies.



Every Carboloy die is backed by 29 separate rigid tests, each devised to make Carboloy Cemented Carbides the best in industry. You get better, more uniform performance on your wire draw jobs with them.



Any and every Carboloy Cemented Carbide wire draw die in operation proves, by test, its amazing production capacities. Every time you put a Carboloy die on the job in your plant, you'll find proof of its perfection in its performance.

Carboloy's tremendous research facilities are constantly focused on continuous grade improvement, rather than changing grades for special purposes. You can always be sure of the latest *and* best with Carboloy dies.

You can get the best dies available for your wire draw operations by specifying Carboloy. Start enjoying the benefits they can bring you *today*. For further information, or engineering assistance, write:

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Wire and Tube Drawing Dies

Carboloy congratulates *Wire and Wire Products* magazine on its 25th anniversary, and on the many contributions it has made to the industry during this quarter century.

ACCORDING to equation (3) the area of the annulus on 1 wire will be given by

$$A = \frac{Q C_r}{100 \times 7.5 \times v \times C_o}$$

This being so the thickness of the film on 1 wire will be given by (7), as

$$\chi = \frac{2 Q C_r}{\pi \times 100 \times 7.5 \times v d C_o}$$

Substituting the values given, we get the thickness of the liquid film to be

$$\frac{2 \times 5 \times 12 \times 1}{\pi \times 100 \times 7.5 \times 300 \times .025 \times 500} = .0000136'' \text{ or } .000163''$$

Thus, for approximate purposes, the film of liquid on each wire is about 2 ten thousandths of an inch thick.

* The 12 in the numerator results from the fact that the diameter of the wire is required in ft., so will be: .025 / 12.

★ ★ ★

THE same method can be used for determining the thickness of the liquid film on a strip or tape that is being plated, provided that the tape passes through a roller squeegee as it leaves the plating bath (this is usually the case) so that a uniform film can be assumed. Based on this assumption, the area of the rectangular annulus shown in figure 3 is 2tw where w is the width of the strip and t is the thickness of the film and accordingly for a strip, the thickness of the liquid film is given by 8)

$$t = \frac{Q C_r}{2 W \times 7.5 v C_o}$$

★ ★ ★

AS an example of the use of this equation consider the following case: A strip 2 ft. wide is being plated with tin at a velocity of 600 ft. per minute. The rinse tank following the tin bath has water flowing at 10 gpm. The dilution ratio on test is 1/400. What is the thickness of the liquid film of drag-out?

$$t = \frac{10}{2 \times 2 \times 7.5 \times 600 \times 400} = .0000014' \text{ or } .000017''$$

So the film is roughly two one hundred thousandths of an inch thick on each side.

★ ★ ★

IN connection with making these tests for determining drag-out losses and film thickness, it should be pointed out that where a recovery rinse tank is used—which subject will be discussed in a future paper—immediately after a plating bath, the recovery rinse should be temporarily connected as an ordinary running rinse tank, filling it with fresh water to start. Once the test or series of tests have been made, the recovery rinse can be restored to the line again, as a recovery rinse tank.

★ ★ ★

The Annual Convention of the WIRE ASSOCIATION

will be held in Baltimore, Md., at the Lord Baltimore Hotel October, the 18th thru the 22nd, 1950.

The Program Committee, of which Carl E. Johnson of the Bethlehem Steel Company, is serving as General Chairman, has already organized a program of good ferrous and non-ferrous technical papers with two plant inspection trips. A fine session is anticipated.

Now is the time to note on your calendar the time and place of this important meeting. Program details and other data will be published in Wire and Wire Products at a later date.

THE WIRE ASSOCIATION

Richard E. Brown, Executive Secretary

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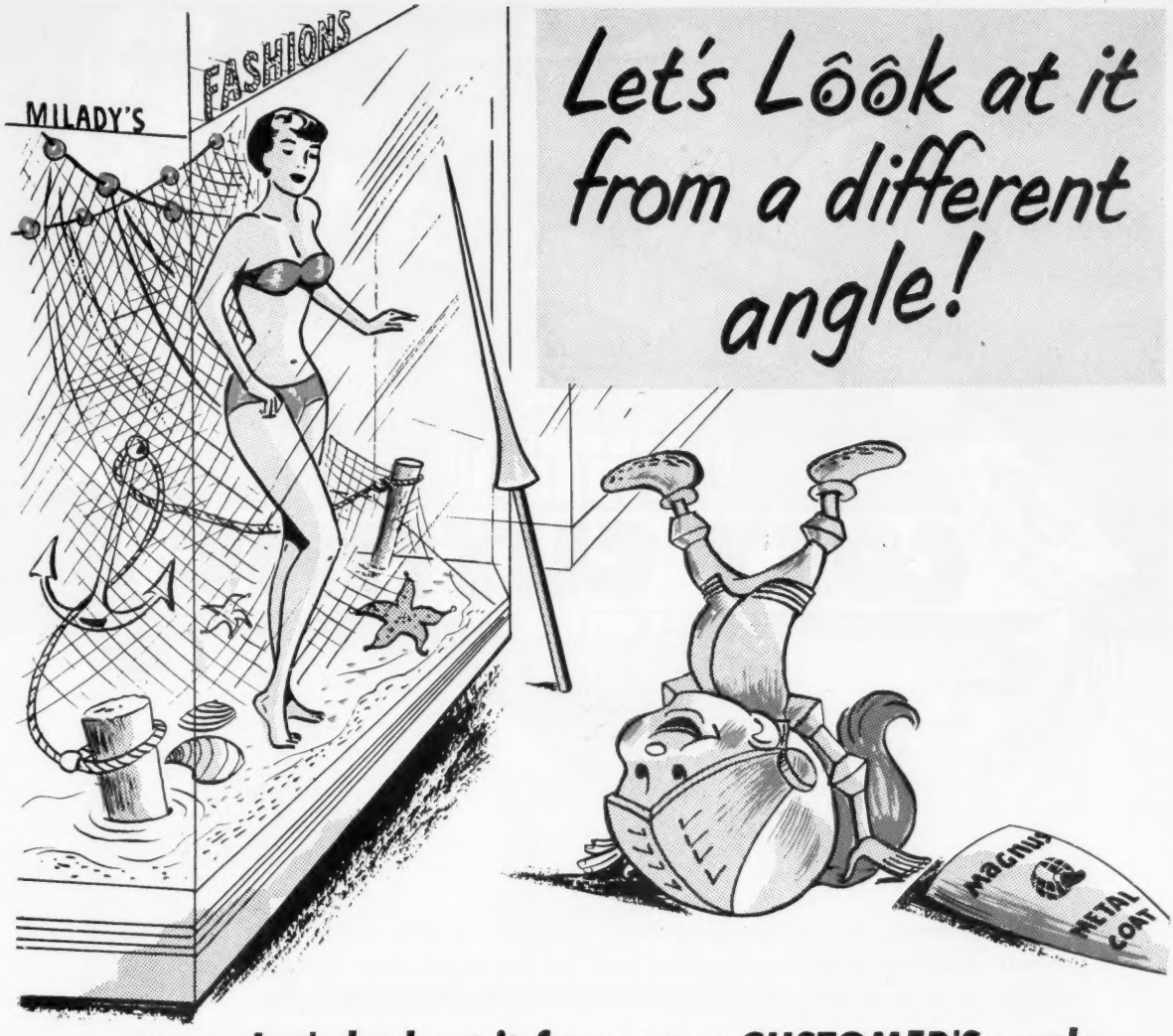

Let's Lôôk at it from a different angle!

Let's look at it from your CUSTOMER'S angle

The less cleaning he has to do, the better pleased he will be with the wire you furnish him. Every time rod or wire is cleaned in acid, there is a decided loss of metal. There is also loss of time in extra cleaning operations—to say nothing of the cost of acid and labor.

When you use Magnus Metalcoat #267 or #267-C* in your wire mill to coat and draw your customer's wire, you are saving him time and money, because you are supplying him with CLEAN wire—ready for any further finishing.

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And from YOUR angle? A clean, dust-free wire mill; no rust problem; faster drawing speeds; better finished wire; less lubricant used; much longer die life; greater output of finished wire at far lower over-all cost!

In our complete line of Magnus "DRILUBES," there is a perfect lubricant for any wire drawing job. Prices are the lowest in history, too.

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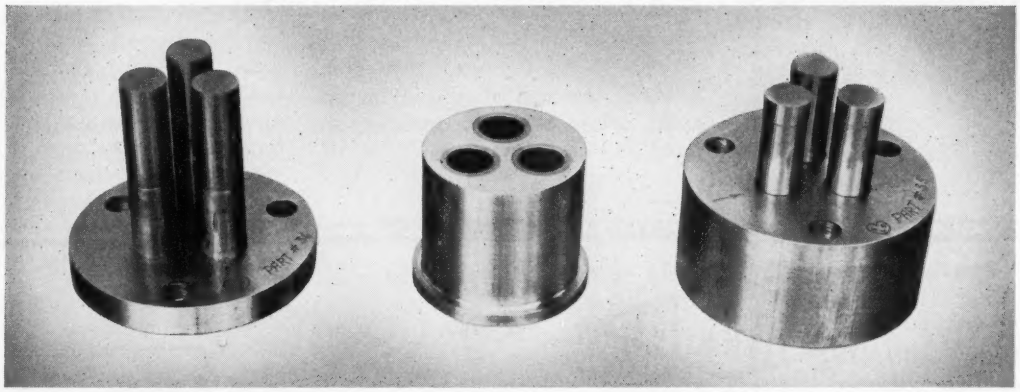

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The illustration above shows a typical application of HARTLEY Workmanship on compacting dies, showing the die and two sets of punches. This is a type of work that requires the utmost of care and precision in manufacture, and is illustrative of the same kind of thoroughness that goes into the making of HARTLEY wire drawing dies and all their other cemented carbide products. This is why HARTLEY carbide dies, tools and parts are giving so much satisfaction.

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GOVERNMENT WIRE PRODUCTION INFORMATION

Room-Temperature Mounting of Metallurgical Specimens

A SIMPLE, inexpensive method for mounting metallurgical specimens at temperatures only slightly above room temperature and without the external application of heat has been developed by **Denton L. Smith** of the **National Bureau of Standards.** The technique employs a denture material of modified acrylic resin as the mounting. This material consists of a polymer and monomer which, when mixed in the proper proportions, will polymerize or set under pressure at room temperature. As the amount of heat generated by the polymerization reaction can be controlled by varying the amount of resin present, the new procedure makes it possible to mount a wide variety of specimens for polishing and microscopic study without disturbing the crystal structure.

* * *

IN studying the properties of metals, it is often necessary to embed a small metallic specimen within a larger piece of material in order that it may be conveniently held for polishing and microscopic observation. Several methods are now in use for mounting in bakelite, lucite, or solids formed by the setting of resinous powders. However, in all these procedures the specimen is heated to a high temperature under pressure, which often causes recrystallization and change in the structure of the metal. Moreover, rather expensive equipment is usually required. The method developed at the Bureau, on the other hand, may be carried out in 15 to 30 minutes, depending on the temperature of the room, without the use of special equipment other than an inexpensive mold and a clamp or vise.

* * *

Revision of Thermocouple Tables

AN extensive project is now under way at the National Bureau of Standards for revision of all the common thermocouple tables in order to take into account the recent changes in electrical units and in the International Temperature Scale. Present plans call for the publication during 1950 of eight tables giving the temperature-emf relations for platinum-platinum rhodium, chromel-alumel, and copper-constantan thermocouples.

* * *

THE temperature-emf tables for thermocouples previously issued by the Bureau have been widely used in science and industry, not only to convert thermocouple voltages into the equivalent measured temperatures but also in the preparation of purchase specifications for thermocouple wire and in de-

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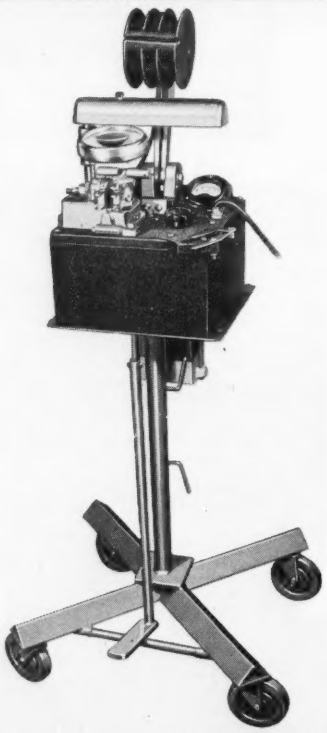
Equipped with a temperature indicating annealing and tempering device, voltage regulator and meter to compensate for voltage fluctuation, wire cutters, extra large 5" diameter magnifying glass, fluorescent light and extension cord. Welder can be supplied for bench mounting, or mounted on 4-wheel truck.

The adaptability of this unit for welding all types of wire, either ferrous or non-ferrous, in sizes from .005" to .020" diameter, makes it ideal for the fine wire manufacturer.



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fining the relation between impressed emf and scale reading for pyrometers which indicate temperature directly. Recently, however, in accordance with international agreement, the Bureau adopted the absolute electrical units and began using the definitions of the new International Temperature Scale of 1948 both in its own research program and in calibrating instruments for other laboratories and industries. Revision of the thermocouple tables was then advisable in order to make them consistent with former usage.

★ ★ ★

A LIMITED number of rough-draft advance copies of the first two publications has been prepared to meet interim demand where the need is great. Others will become available in the order listed. Inquiries and suggestions regarding the tables should be addressed to Dr. Robert J. Corruccini, Pyrometry Laboratory, National Bureau of Standards, Washington 25, D. C.

★ ★ ★

Polarized Light Shows Nature of Plastic Deformation in Monel Metal

THE ability of a metal to deform plastically without breaking enables it to withstand the inevitable misalignments and changing stress conditions that occur in machines and structures. Likewise, the shaping of a metal by rolling, pressing, drawing, or forging is dependent on its ability to deform plastically. A thorough knowledge of the factors involved in the plastic deformation of metals thus becomes highly important in obtaining maximum service from machine parts and other metal products.

★ ★ ★

CHANGES in the orientation of the crystals, or grains, that make up the commercial metals are known to play an important part in the deformation process. However, attempts to study grain orientation by the usual X-ray diffraction methods have been

● Corrosion resistant ● Extra strength
● Shiny smooth finish ● Uniform temper

KEYSTONE'S GALVANIZED MB WIRE offers improved corrosion resistance . . . gives added life and strength to mechanical springs subject to rust and corrosive conditions.

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Keystone is prepared to help solve any of your industrial wire problems. If special treatment is called for, Keystone's metallurgical research and testing facilities are available to supply the answers. We welcome your inquiry.

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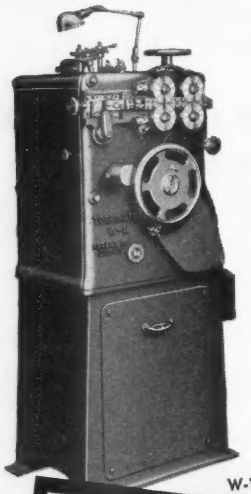
In spring coiling, the words "Torrington" and "Versatile" are synonomous!

When producing springs to meet exacting requirements, the professional springmaker with a Torrington coiler is the man to see. He's the man who can supply your needs with accuracy, speed and economy.

On any special spring, our sales department will be glad to help you find a source of supply, or if need be, help the springmaker devise the tooling to produce it.

This is the W-11, one of fourteen versatile Torrington Spring Coilers:



W-11

SPECIFICATIONS

Wire Diameter Range: .015" to .072"

Wire Length per Spring: 0" to 42" (Extra Wire Feed Gears Available)

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rather unsuccessful where only minute areas are involved. An obvious difficulty, for example, has been the identification of the area from which the diffraction pattern was obtained. Recently, D. H. Woodard of the National Bureau of Standards, in the course of plastically deformed Monel metal, developed a technique[1] which uses polarized light to make visible differences in orientation that result from the deformation of a fully annealed specimen. Though use of the technique has thus far been confined to Monel, the method is expected to find application in studies of plastic deformation in other metals.

★ ★ ★

WHEN Monel is polished and treated with most etchants, it is optically isotropic, reflecting polarized light equally in all directions. However, when specimens were given a light etch (about four seconds) with the Monel Contrast Etch (an aqueous solution of chromic and nitric acids in ammonium chloride), the surface of the metal became optically active. Under these conditions polarized light can be used to detect differences in grain orientation.

★ ★ ★

MONEL that had been annealed so as to give uniform point-to-point orientation within individual grains was viewed microscopically under polarized light with polarizing elements in the incident and reflected beams crossed. The intensity of the reflected light was uniform over each grain. However, when the annealed Monel was deformed before being sectioned and polished, the intensity of the reflected light was no longer uniform over the individual grains. It was thus possible to study visually those regions which had undergone changes in orientation.

★ ★ ★

TENSILE specimens that had been given different amounts

[1]For more complete details, see Stages in the deformation of Monel metal as shown by polarized light, by P. H. Woodard, Metals Trans. 185, 722 (1949).

of plastic extension were sectioned and polished and used to study the effect of increasing plastic deformation on the changes in orientation within individual crystals. From the irregularity of these changes, it was evident that directions of flow varied within small areas and that the deformation in individual grains was by no means uniform or regular. Furthermore, the deformation was confined neither to the areas near the grain boundaries nor to the center of the grains but depended upon the orientation of adjacent crystals and the direction of the stresses they imposed.

★ ★ ★

THIN, straight parallel lines known as "slip lines" are usually visible on polished and etched surfaces of annealed metals after slight deformation. Sometimes these lines are curved on specimens that have been deformed previously. There has been some question as to the interpretation of this curvature. Some investigators have suggested that a group of such curved lines represents a set of crystallographic planes which are bent; others contend that the curves are the traces of several sets of parallel crystallographic planes which remain straight but combine to give the effect of curved lines. Use of polarized light at the Bureau to show differences in orientation along the length of a line indicated that the slip lines were traces of crystallographic planes that had been bent prior to the formation of the slip lines. Some of the differences in orientation observed in individual grains, which were more pronounced after severe plastic deformation, may therefore be interpreted as bending of the crystal lattice. This bending of the crystals during plastic deformation leads to the development of deformation bands. As deformation proceeded, these bands behaved as individual crystals and thus could be considered as fragments of the original crystal.

★ ★ ★

IT was found that the total intensity of the combined reflec-

(*Please turn to page 453*)

WOOD REELS
with SERVICE plus

If your mill is located anywhere within 200 miles of Hazardville, we will deliver them to your door in BRIDGE trucks—and overnight, in case of emergency.

For points beyond, carload shipments out of Springfield, Mass., via N.Y.C.R.R. can be in cities as far away as St. Louis on the third day. L.C.L. shipments to points like Buffalo or Cleveland via the Pacemaker will arrive the second morning and be delivered to your door *at no extra cost.*

BRIDGE REELS for CABLE, ROPE and WIRE are made in returnable and non-returnable types in sizes from 12" to 96" in diameter.

ALSO, REELS, HEADS FOR STEEL DRUMS BRIDGE SHIPPING and SHOP REELS are furnished assembled or knocked-down, made to your specifications. Built to withstand severest handling.

You are invited to avail yourself of our unique and efficient service and to visit our plant to see how BRIDGE REELS are made so well and why they are so sturdy and low in cost.

Send us your specifications and let us quote on costs.

BRIDGE MFG. CO.
Inc.
HAZARDVILLE ● CONNECTICUT

Outstanding Personalities of the Wire Industry

Thomas I. S. Boak Elected to Directorate of the Plume & Atwood Mfg. Co.

THOMAS I. S. BOAK, former plant manager of Winchester Repeating Arms Company of New Haven, has been elected president and treasurer of **Plume & Atwood Manufacturing Company** of this city and Thomaston. He assumed his official position February 20th, succeeding Gordon B. Hurlbut, who has been head of the corporation since 1945. Mr. Hurlbut who stated that he plans to establish a business organization of his own remained with the firm until March 1st.

★ ★ ★

MR. BOAK became manager of the Winchester division of Olin Industries in 1932 and managed the New Haven plant during the war.

★ ★ ★

MR. HURLBUT retained presidency of the company two years ago. Present directors are Henry Shepard, Hartford; Richard Valentine, Stafford Springs; Harry MacCallum, Mt. Vernon, N. Y.; Clayton Burt, Hartford; James Curtis, formerly with Revere Brass & Copper Company and now general manager of the P&A Waterbury plant; Ernest Britten, Hartford, and Michael Dolak, Hartford.

★ ★ ★

THERE have been some intimations that further changes may be made in the personnel of the company and in manufacturing and sales policies, but such rumors lack official verification.

★ ★ ★

Beryllium Corporation Elections

AT the annual meeting of the stockholders of the **Beryllium Corporation** held at Reading, Pa., on March 28th, the following directors were elected:

Matthew J. Donachie
Otto T. Englehart
Maurice A. Hallam
Richard M. Quimby
Daniel D. Schwartz

★ ★ ★

MR. **SCHWARTZ** was made Chairman of the Board and other officers were elected:

President—Mr. Englehart
Vice President—Mr. Donachie
Secretary—Mr. Quimby
Treasurer—B. V. Edridge

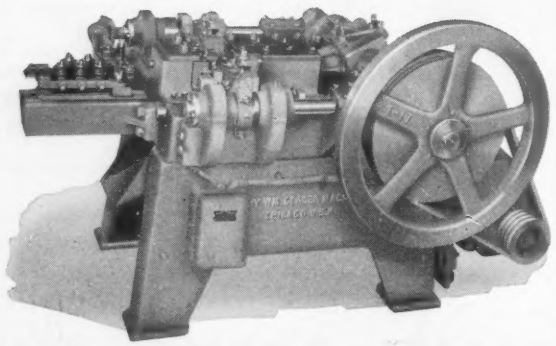
★ ★ ★

Personnel Changes in American Steel & Wire Company

CLIFFORD F. HOOD, has been elected president of **Carnegie-Illinois Steel Corp.,** succeeding Charles R. Cox, now president of Kennicott Copper Corporation.

★ ★ ★

GLADER HIGH SPEED WIRE NAIL MACHINE



MACHINE ARRANGED FOR INDIVIDUAL MOTOR DRIVE

High tonnage output, and low maintenance costs, have resulted in Glader Machines being accepted as standard equipment in every large nail mill built in the United States in the past twenty years.

Glader Machines are operating in most of the wire producing mills throughout the world.

These machines are made in eleven different types and sizes. This enables us to cover the range of sizes of nails produced with the greatest efficiency.

For further information please address,

WM. GLADER MACHINE WORKS
210 No. Racine Ave.
Chicago 7, Illinois
Export Dept.: 122 E. 42nd Street, New York 17, N. Y.

HARVEY B. JORDAN, formerly vice-president in charge of operations, succeeds Mr. Hood as president of American Steel & Wire Company, and in turn is succeeded by **Walter F. Munford** as vice president in charge of operations.

★ ★ ★

VAN H. LEICHLITER, veteran steelmaker, with the company for the past 20 years, has been made assistant to Mr. Munford, and is now making his headquarters in Cleveland. He was superintendent of the South Works at Worcester at the time of his promotion.

★ ★ ★

Standard Machinery Adds Albert J. Duclos to Engineering Staff

IN line with its expansion program necessitated by increased business in their line of extruding machines for the rubber, insulated wire and plastics industries, **The Standard Machinery Company,** Mystic, Conn., has appointed **Albert J. Duclos** to its engineering staff. In announcing the appointment, Edmond Spencer, Chief Engineer, mentioned Mr. Duclos' training at the Rhode Island School of Design and his previous association with the engineering departments of wire machinery manufacturers.

★ ★ ★

Davis Heads Morrison Engineering Corp.

LEONARD A. DAVIS was elected President of the **Morrison Engineering Corporation,** Cleveland, Ohio at a recent meeting of the Board of Directors. He succeeds Carl R. Sare, who resigned to assume other responsibilities.

★ ★ ★

MR. DAVIS has had extensive experience in sales and engineering of hydraulic machinery and heating equipment for the light metals industry. He was formerly associated with the Lombard Corporation of Youngstown, Ohio.

★ ★ ★

AT the initial sales conference, Mr. Davis stated that he will maintain the current policies of the Morrison Engineering Corporation. They will continue to design and build Morrison "Flash Bakers," Truck-Type Rod Bakers, Core Ovens, Paint Ovens, Nonferrous Forging Furnaces, Conveyorized Furnaces and Finishing Systems.

★ ★ ★

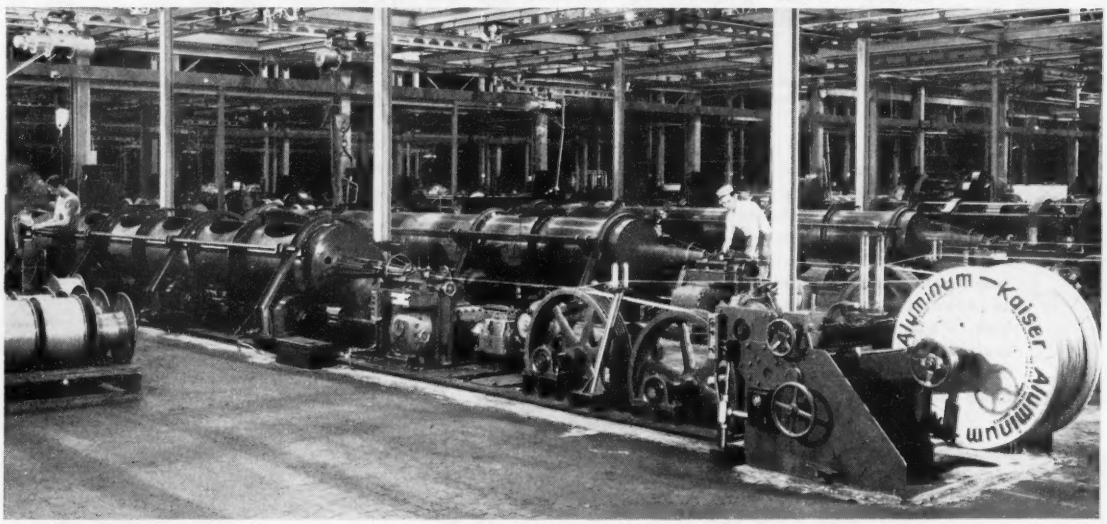
President of Bristol Brass on Speaking Tour

ROGER E. GAY, president of the **Bristol Brass Corporation,** Bristol, Conn., made a two week speaking tour in March through Minnesota and Wisconsin, talking on current business trends, to give economic and business administration students in various colleges and universities a business man's point of view on industry and government. Mr. Gay is a director of the National Association of Manufacturers, under whose auspices his itinerary was arranged.

★ ★ ★

NEW 22" SPOOL 750 RPM TUBULAR STRANDER

HYDRAULIC LIFT REEL STAND—INFINITELY VARIABLE TRAVERSE AIR CONTROLLED
DOUBLE DRUM HAUL-OFF WITH LINK BELT P.I.V.—AIR OPERATED BRAKING SYSTEM



HMT — ESTABLISHED 1846 — HUGHESVILLE MACHINE & TOOL COMPANY — WIRE & PROCESS MACHINERY

Hi-Efficiency

HUGHESVILLE MACHINE & TOOL CO.
54 ACADEMY STREET
HUGHESVILLE, PA.
'Phone: 129-A

Acquires Roebling's Coil Winding Division

ELECTROCOILS, INC., newly-organized coil winding firm with factory and sales office located at Trenton, N. J., has begun manufacturing operations at its plant here. Successor to the long-established Coil Winding Division of the John A. Roebling's Sons Company of Trenton, whose entire production equipment it recently purchased, ELECTROCOILS is offering a complete line of taped form wound, self contained paper section and cotton interweave solenoid coils as well as coils specifically intended for high temperature application.

JOHN J. BEDNAR, President-Treasurer of Electrocoils, Inc., Trenton, N. J.

* * *

JOHN J. BEDNAR of Trenton and **John E. Nolan** of Lavallette, N. J. have been named President - Treasurer and Sales Manager respectively of the new Company. Both Bednar and Nolan are veterans in the coil winding business, having been employed for many years in the production and sales units of the Roebling Company's Coil Winding Division. All of ELECTROCOILS' production personnel are also experienced coil winding operators with long service records with the Roebling Company.

* * *

IN addition to Bednar and Nolan, other ELECTROCOILS' officers include **Edwin T. Goodridge,** of Princeton, N. J. and Cleveland, Ohio, Vice President; and **Hugh D. Wise, Jr.,** of Princeton, Secretary.

* * *

JOHN E. NOLAN, Sales Manager of Electrocoils, Inc., Trenton, N. J.

The SPECIALISTS in Wire - Straightening and Wire - Cutting!

Diameter Range — 1/16" to .005"

PRECISION - Our Motto

DON'T hesitate to call on us when you are confronted with wire-straightening problems involving close tolerances and absolute accuracy. For seventeen years we have specialized in straightening and cutting all gauges of fine wire, hard or soft, ranging in diameter from one-sixteenth of an inch down to five-thousandths of an inch. We employ gun-barrel accuracy in straightening lengths from one inch to ten feet or any fractional part thereof. Ends cut absolutely clean without burrs.

ASK ABOUT OUR UNEXCELLED FACILITIES FOR CLEANING AND POINTING WIRE ALREADY STRAIGHTENED AND CUT.

ALL TYPES OF WIRE...

- Nickel
- Stainless Steel
- Bronze
- Brass
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- Music Wire
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- Florist Wire

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PITTSBURGH CUT WIRE COMPANY

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ROLOCK FABRICATED ALLOYS

HEAT AND CORROSION RESISTANT

The Hook...

THAT LANDS THE **BIG ONES**

BIG ORDERS, we mean... and why not! Here's the last word for wire coil handling. It's rugged. Handles 4000 lb. load of coils. It's much safer to use. Fabricated—welded in Steel for rod baking, Monel for pickling steel, Stainless Steel for pickling brass.

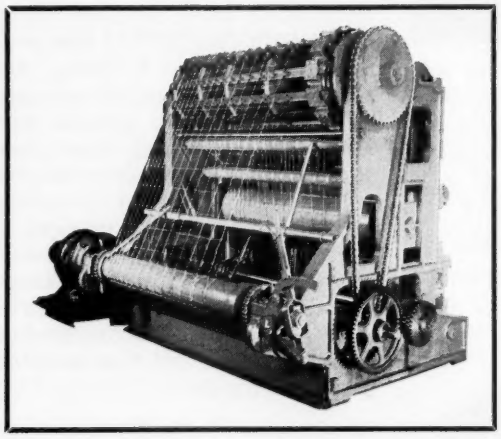
This one (of an order of 10) is 7'6" long; hook 3'8½"; throat 16", but can be made to suit your load and existing tank. Cuts hourly costs, gives long service life, handles easily and safely. Reorders indicate high satisfaction. May we quote?

ROLOCK INC. 1312 Kings Highway, Fairfield, Conn.

Offices in: PHILADELPHIA • CLEVELAND • DETROIT • HOUSTON • INDIANAPOLIS • CHICAGO • ST. LOUIS • LOS ANGELES • MINNEAPOLIS

JOB-ENGINEERED for better work
Easier Operation, Lower Cost

INTERLOCKING FENCE LOOMS



- Preferred By Leading Mills.
- Wrapped Stay—Farm Or Poultry Fence.
- Fastest In The Industry.
- Cuts 135 To 145 Stays Per Minute.
- Most Efficient In The Industry.
- Compact Neatly Finished Rolls.
- Single Or Double Strands.
- Patent Protected.

Write for Detailed Information — Without Obligation

Interlocking Fence Co., Dept. L, Morton, Ill.

Specialists In Fence Looms

Gordon Simons Now Director of Research for Beryllium Corp.

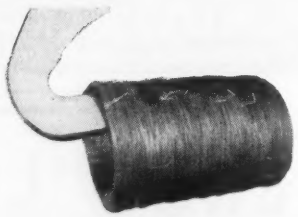
OTTO T. ENGLEHART, President of **The Beryllium Corporation,** Reading, Pa., announces the appointment of **Gordon F. Simons** as Director of Research. Mr. Simons is eminently suited for the post, having been signally associated with the company in process development and product research since its inception. His recent activity in Sales brings to the Research Department a thorough knowledge of present customer requirements and of industry demands for new beryllium alloy applications.

★ ★ ★

W. THOMAS PETERSON succeeded Mr. Simons as General Sales Manager. Mr. Peterson has been active in the automotive industry for over twenty years as a Sales Engineer and has represented The Beryllium Corporation in the Detroit area for several years.

★ ★ ★

Are you using *Steam* for your wire baking?



STEAM can be an excellent heat source for most processing operations, BUT NOT FOR WIRE BAKING. Experience throughout the wire industry has proven that its temperature limitation, rusting effect on coils, leakage from coils and similar disadvantages result in sizable losses in time, labor and materials.

More and more progressive wire plants are converting their present steam equipment to efficient ROSS Oil or Gas Fired Air Heaters that produce temperatures of 350 deg. F. and higher to greatly shorten baking time, eliminate leaks and frequent repairs, and assure a smoother, scale-free lime coat. Consult us about the investment value of converting your present steam system. No obligation.

ROSS KS SYSTEMS
J. O. ROSS ENGINEERING CORPORATION
MANUFACTURERS OF AIR PROCESSING SYSTEMS
350 MADISON AVENUE NEW YORK 17, N. Y.

351 N. Wells Street, CHICAGO-6 • 79 Milk Street, BOSTON-9 • 9225 Grand River Avenue, DETROIT-4 • 600 St. Paul Avenue, LOS ANGELES-14
ROSS ENGINEERING OF CANADA, LIMITED, MONTREAL, CANADA • CARRIER-ROSS ENGINEERING COMPANY, LIMITED, LONDON, ENGLAND

F. F. Tiffany and T. D. Lewis Appointments Announced

DAVID P. REYNOLDS, Vice-President and manager of **Reynolds Metals** General Sales Division, recently announced two appointments in the Company's Aluminum Division.

★ ★ ★

F. F. TIFFANY, formerly District Manager of the Company's Dayton, Ohio office, has taken over the duties of Division Manager in the Pittsburgh area, with headquarters in the Company's Pittsburgh field office.

★ ★ ★

T. D. LEWIS is now Division Manager located in the Atlanta office, after having served for some time as sales representative in the San Francisco area.

★ ★ ★

Link-Belt Appointments

LINK-BELT COMPANY announces that **David E. Davidson** has been elected vice-president for sales, with headquarters at 307 N. Michigan Ave., Chicago (1). Mr. Davidson, a mechanical engineer has been general manager at the company's Pershing Road plant, Chicago, since 1947. He entered the employ of the company in 1924 in the shop.

★ ★ ★

ANNOUNCEMENT is also made that Eugene P. Berg, formerly assistant general manager, has been appointed general manager of the Pershing Road plant, to succeed Mr. Davidson. He has successively served as supervisor of the methods department at Pershing Road; general foreman of the steel shop; works manager at the company's Philadelphia plant; general superintendent at Pershing Road, and then assistant general manager.

★ ★ ★

L. R. Gustin Appointment

L. R. GUSTIN has been appointed assistant superintendent of the Los Angeles bolt and nut plant of **Bethlehem Pacific Coast Steel Corp.** He previously served as general foreman of the bolt and nut department.

★ ★ ★

Huber Heads Roebling's Wire Rope Division

CHARLES R. TYSON, president of **John A. Roebling's Sons Company,** announced that as of April 1st **Walter A. Huber** was appointed general manager of the Wire Rope Division.

★ ★ ★

THE appointment is part of a plan to decentralize the company's various divisions. The objective of the new program is to specialize each product division

WALTER HUBER, General Manager Roebling's Wire Rope Division.

for more production efficiency and better service to customers. Mr. Huber will coordinate administrative and production work with merchandising schedules and customer requirements. The Wire Rope Division, which he is taking over, is one of the company's most important operations and one for which it is best known. The Roebling Company has a long history of leadership in the wire rope manufacturing field. Mr. Tyson expressed confidence that the new head of this division would actively pursue the continuance of this leadership.

★ ★ ★

MR. HUBER is a national figure in the wire rope industry. For the past nine years, he has served as manager of preformed wire rope sales for the American Chain and Cable Co., Inc., and prior to that had served as assistant to the president and sales manager of the wire rope division of the Jones and Laughlin Steel Corp. He has been secretary of the Wire Rope Institute for the past ten years.

★ ★ ★

Glaser Heads Neg'ator Division

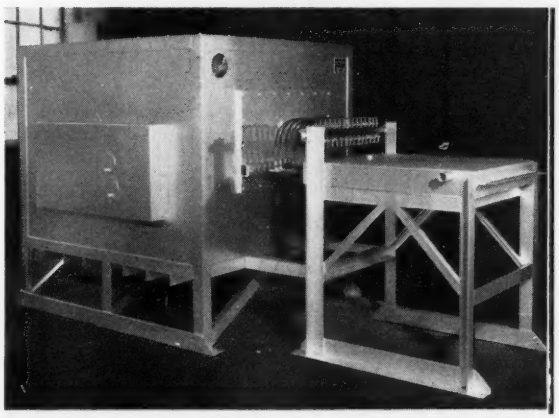
LEO B. GLASER has just been appointed Manager of the newly formed **Neg'ator Division of the Hunter Spring Co.,** Lansdale, Penna., according to **W. J. Cook,** General Manager.

★ ★ ★

MR. GLASER assumes responsibilities for supervision of all activities concerned with production, design and development of the Neg'ator, which was introduced to industry last year. The Neg'ator is the new elastic member which, contrary to prior accepted thinking, has negative or constant force-deflection characteristics.

★ ★ ★

298,636 MILES OF WIRE ANNEALED IN ONE YEAR IN HARPER STRAND ANNEALER



operating 24 hours a day for two years, *with never a trace of trouble.*

This remarkably efficient 30-tube electric atmosphere furnace has been on the job continuously day and night at one plant annealing 304 stainless weaving wire in sizes of .020" to .0014". Temperatures of 2000° to 2200° F were used and speeds of 100 f.p.m. maintained. Softer wires run at somewhat lower speeds.

This HARPER furnace has practically eliminated rejections.

The annealing of stainless steel wire is a delicate job, requiring maintenance of temperatures within narrow limits. This HARPER unit has been of inestimable value in producing wire at exceptionally uniform quality. What HARPER has done for one mill can be duplicated for you on stainless or other metals.

You are invited to consult HARPER engineers on your wire problems.

Address inquiries to

HARPER ELECTRIC FURNACE CORP.

1444 Buffalo Avenue
Niagara Falls, N. Y.

Designers and Builders of High Temperature Electric Furnaces.

Harris New Works Manager for Chase

MELVIN C. HARRIS was appointed works manager of the Cleveland mills of **Chase Brass & Copper Co., Inc.**, succeeding **William F. Aylard**, named chief engineer of the company. Mr. Harris had been associated with Allegheny Ludlum Steel Corp., at Pittsburgh as vice president in charge of operations.

★ ★ ★

Detroit Steel Corporation Appointments

V. R. BATES was appointed manager, cold-rolled strip sales, and **N. J. Froelich**, manager, wire and wire products sales, **Detroit Steel Corp.**, Detroit. **J. M. Gillard** is manager, Detroit district sales office. **L. G. Bygrave** and **J. F. Timmerman** became assistant sales managers.

★ ★ ★

Thermoplastic
Cable Sheathing Kraft

was designed for use in

NONMETALLIC SHEATHED CABLE

and is used without waxing

to meet Underwriter's tests.

Patent applied for by

Merrimac
Paper Co., Inc.

Mills — Lawrence, Mass.

295 Madison Ave., New York City

Also Manufacturers of Electric
Saturating Papers and Underground
Cable Insulation.

Columbia Steel Co. Announces Personnel Changes

COLUMBIA STEEL CO., San Francisco subsidiary, U. S. Steel Corp., announces personnel changes in connection with a reorganization of its metallurgical division. **Robert B. Freeman**, named chief metallurgical engineer, continues in charge of the division; **G. L. von Planck**, continues as metallurgical consultant, and also handles alloy, stainless and tubular products; **W. B. Kennedy**, named senior service metallurgist, central sales division, is assisted by **J. M. Carrera. C. H. Fitzwilson Jr.**, formerly attached to the tin plate bureau, Carnegie-Illinois, another subsidiary, was appointed metallurgical engineer in charge of flat rolled products; **D. W. Hadsell** was named metallurgical engineer in charge of bar, structural and wire products and **A. H. Danielson**, appointed staff assistant to Mr. Freeman. Metallurgists attached to the southern sales division with offices in Los Angeles are: **R. A. Schaus**, senior service metallurgist; **B. W. Buist** and **J. W. Wunderlich**, service metallurgists.

★ ★ ★

D. Gardner Foulke Appointment

D. GARDNER FOULKE has been appointed chief chemist in charge of analysis and customer service for **Hanson-Van Winkle-Munning Co.**, Matawan, N. J. He has been process electrochemist of the company for the past three years.

★ ★ ★

P. C. Buck Appointment

P. C. BUCK was made vice president in charge of production of **Acheson Colloids Corp.**, Port Huron, Mich. Other appointments included **M. W. Reynolds**, new vice president in charge of sales, and **Raymond Szymanowitz**, new vice president in charge of research. All three men are veterans of the Acheson organization, having been with the company for 30, 25 and 24 years respectively.

★ ★ ★

Frank A. Luebbe

FRANK A. LUEBBE, vice president and general sales manager of the **Nichols Wire and Aluminum Company,** Davenport, Iowa, died recently.

* * *

MR. LUEBBE was born in Cincinnati, Ohio, on October 10, 1893, and was educated in that city, being graduated from St. Joseph's College.

* * *

HE had become a widely known sales executive in both the steel and aluminum industries and his passing is noted with sincere regret.

* * *

J & L Appointments

ALBERT T. LAWSON has been elected to the newly created position of vice president—general services of **Jones & Laughlin Steel Corp.,** Pittsburgh. Since 1947 he has been general superintendent of the Pittsburgh Works. **L. A. Lambing** was appointed to that position, succeeding Mr. Lawson.

* * *

V. H. LAWRENCE, formerly vice president in charge of plant development and employee and public relations of the company at Pittsburgh, was transferred to the newly created position of vice-president in charge of planning and control.

* * *

O. C. Berkobein Gives Up Sales Duties

O. C. BERKOBEIN, who for many years has served as president as well as sales director of **U. S. Steel Wire Spring Co.,** Cleveland, is now relinquishing his sales duties and will devote his time to overall policy planning and direction of the company's entire operation. **Walter J. Kimpel** was appointed sales manager. He has been associated with the spring industry for over 35 years and until recently was sales manager of Cleveland Wire Spring Co.

* * *

Heads Research for Houghton

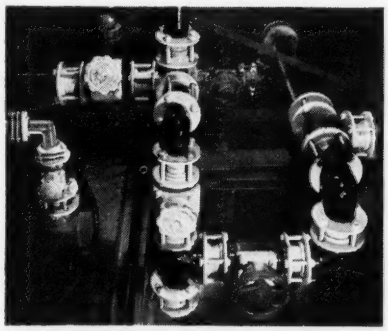
DR. JAMES T. EATON has been named Director of Research of **E. F. Houghton & Co.,** Oil and Chemical Manufacturers, Philadelphia. Dr. Eaton, who was formerly Manager of Research, is now in full charge of the company's Research & Control Department. He was recently elected a member of the company's Board of Directors.

* * *

Copperweld Steel Appointment

WILLIAM J. MURRAY received the appointment as manager of the fence department of **Copperweld Steel Co.,** Glassport, Pa. In his new capacity, Mr. Murray will head the sales and installations of Copperweld chain link fence, barbed wire and other Copperweld products.

* * *



Now you can FORGET ABOUT Corrosion on . . .

PIPE, VALVES
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Make your process equipment of HAVEG—and you can forget about corrosion! HAVEG is a different molded structural material that resists chemical action *through its entire mass.* Not just a lining or coating, its utility is not affected by surface gouges and abrasion. Moreover, HAVEG is strong. It resists shock. And it is remarkably easy to machine!

Standard items such as pipe, fittings, etc. can be shipped to you right from stock . . . specially designed and built tanks, and other "custom-built" equipment, will be delivered in just 4 weeks or less! So get your order in today—or write for the engineering bulletin F-5, today.

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1201 Palmolive Bldg.	550 Leader Bldg.	57 Farmington Ave.	4601 Montrose Blvd.	2832 E. Grand Blvd.	601 W. Fifth St.	Vance Bldg.
Delaware 7-6266	Cherry 7297	Hartford 64250	Jackson 2-6065	Madison 1575	Mutual 8955	Elliot 0890

Alcoa Appointment

E. D. MAIRS has been appointed works manager of the new rod, wire and cable mill of **ALCOA** at Vancouver, Wash., and **R. W. Knapp** was named assistant. Mr. Mairs has been with the company since 1926 in various capacities and Mr. Knapp joined the organization in 1940. Both were transferred from the Massena, N. Y., works. Other appointments at the new mill include: **Douglas Sharp,** industrial engineer; **Danforth Barney,** metallurgist; **Fred W. Paulsen,** mechanical engineer; **J. P. Lamoureux,** production planning; **Lee Steinbarge,** maintenance supervisor and **Otto F. Turner,** supervisory staff of fabricating division.

* * *

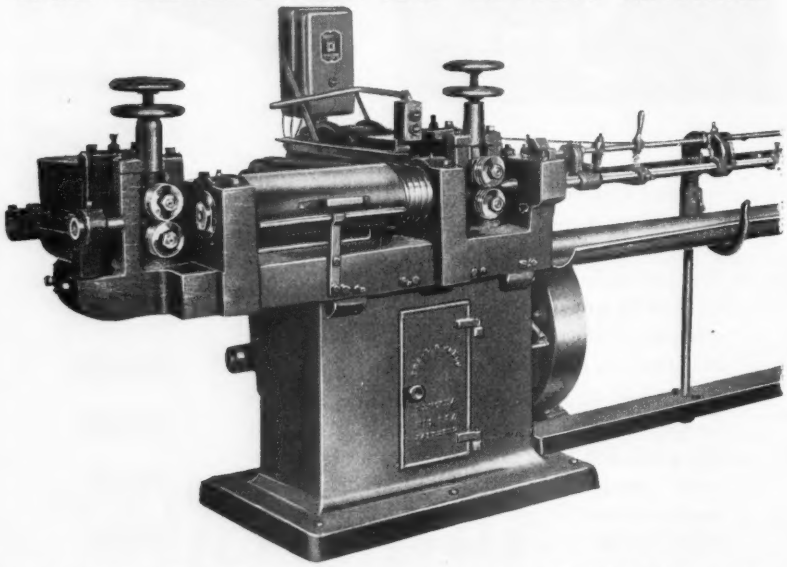
C. M. Kay Appointment

CHARLES M. KAY was named division superintendent of steel works for the **American Steel & Wire Co.,** South Works, in Worcester. Mr. Kay succeeds to the office vacated by **U. F. Corsini.**

* * *

Lower Your Costs with a Wells

WIRE STRAIGHTENING AND CUTTING MACHINE



1—Our No. 6 Wire Straightening and Cutting Machine shown above is built to handle 3/16″ to 3/8″ wire in any length from 12″ up.

2—Completely motor driven and built for long and economical service.

3—Other machines built in various sizes to handle from #16 gauge to 5/8″ diameter stock.

Compare our prices and production. Write for circular.

Frank L. Wells Company

5821 5th AVENUE • KENOSHA, WISCONSIN

Builders of wire straighteners for over 50 years

Avery C. Adams
President, Pittsburgh Steel Co.

AVERY C. ADAMS has been elected president of **Pittsburgh Steel Co.,** Pittsburgh, to succeed **Joseph H. Carter,** who has held that office since 1942 and who has been made board chairman and chief executive officer. The changes became effective Mar. 1st. Mr. Adams, since Jan. 1, 1950, has been executive vice president, Detroit Steel Corp., and previously was vice president and a director of Portsmouth Steel Co. He was formerly vice president in charge of sales and a director of United States Steel Corp., of Delaware.

* * *

Atlantic Steel Co.
Names 3 New Directors

THREE new directors of **Atlantic Steel Co.,** Atlanta, are: **C. B. McManus,** president of Georgia Power Co., and two Atlantic Steel vice presidents, **Joseph H. Girdler** and **Howard B. Johnson.**

* * *

H. B. Young Appointment

HIRAM B. YOUNG, formerly superintendent, Niagara Falls, N. Y., plant, was made works manager, **Hooker Electrochemical Co. Frank W. Dennis,** personnel director and employment manager, was named director of industrial relations for plants at Niagara Falls, Tacoma, Wash., and subsidiary Hooker-Detrex plants at Tacoma, and at Ashtabula, O. **Leonard F. Bryant** was appointed plant superintendent, and **Walton B. Scott,** technical superintendent.

* * *

Townsend Co. Appoints

H. C. WEIDNER, JR., became general superintendent of manufacturing operations of the **Townsend Co.,** New Brighton, Pa. He succeeds **Harry Goodwin** who will continue in an advisory capacity and as director of research and development.

* * *

J. E. Simonin Appointment

J. E. SIMONIN, has been made the **Pittsburgh Steel Co.'s** Allenport, Pa., plant works manager.

A Review of Recent Wire Patents

NO. 2,499,426, GAUGE FOR WIRE-WINDING MACHINES, patented March 7, 1950 by Harold E. Swartout, Davenport, Iowa.

The gauge is for measuring the quantity of wire unwound from a larger spool and wound upon a smaller spool.

★ ★ ★

NO. 2,500,327, BENCH TOOL FOR FORMING END LOOPS ON HELICAL SPRINGS, patented March 14, 1950 by Joseph Leigh Smith, Glen Ellyn, Ill.

This tool comprises frame-mounted jaws, with a ram disposed in one jaw and movable along a straight line toward the other jaw, a punch mounted on the ram for engaging the side of a loop of spring wire and pushing the side of the loop toward the axis of the spring, an anvil mounted on the other jaw, a spring loop cleaving edge mounted on the anvil at one side of the line of travel of the punch, and an anvil stop mounted on the anvil in the line of travel of the punch, this stop being adjustable in position toward or away from the cleaving edge.

★ ★ ★

NO. 2,500,523, METHOD OF MANUFACTURING WIRE CORD, patented March 14, 1950, by Melvin A. Crosby and Enrique L. Luaces, Dayton, Ohio, assignors to The Dayton Rubber Company, a corporation of Ohio.

Highly flexible wire cord is produced by individually coating a number of individual thin strands of wire by immersion in a solution of a rubber-bonding material dissolved in a volatile solvent, evaporating the solvent but leaving the surfaces in a tacky condition thereby forming thereon a film of the rubber bonding material, and thereafter twisting the strands while the surfaces are in a tacky condition to form a cord having the individually coated strands thereof united by means of this film to form a unitary member.

★ ★ ★

NO. 2,500,704, SWITCH MECHANISM WITH WIRE ARMATURE, patented March 14, 1950, by Clarence C. Rennecamp, St. Louis, Mo., assignor, by mesne assignments, to Missouri Automatic Control Corporation, a corporation of Missouri.

The armature is constructed of round wire having the general form of a block letter S with a bar magnet disposed between the lower horizontal legs of the armature, the upper horizontal leg of this armature having an attaching eye formed at its open end, and each of the lower horizontal legs having a portion formed in a general V-shape with its apex toward the magnet, whereby point contact is made between the magnet and the armature as the lower horizontal legs thereof are alternately moved toward the magnet.

Complete Description and Drawings of Patents May Be Had for 50 cents, outside the United States and Canada $1.00. Address, Wire & Wire Products, 300 Main St., Stamford, Conn.

★ ★ ★

NO. 2,500,810, WIRE DRAWING LUBRICANT, patented March 14, 1950, by Frank A. Fink, Cleveland, Ohio, assignor to The American Steel and Wire Company of New Jersey, a corporation of New Jersey.

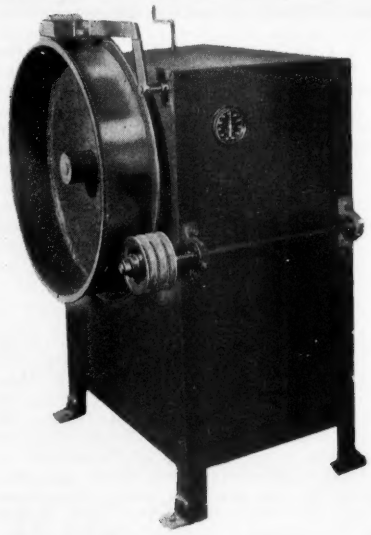
This lubricant comprises a dry mixture of from approximately 20 to 30% ferrous sulphate having water of crystallization and 70 to 80% of an anhydrous water soluble soap containing not more than 5% moisture, the percentages being by weight.

★ ★ ★

NO. 2,501,024, ROLLING MILL FEED TENSIONING DEVICE, patented March 21, 1950, by Carl O. Bruestle, Rahway, N. J., assignor to Borg-Warner Corporation, Chicago, Ill., a corporation of Illinois.

The device is adapted for use with a rolling mill for producing a ribbon-like strand from a round strand of highly ductile metal which is unwound from a coil on a supply roll.

★ ★ ★



MOTOR DRIVEN VARIABLE SPEED

CAPSTAN

TO BE USED WITH

HIGH SPEED PLASTIC EXTRUDERS

A polyphase motor drives a variable speed unit with a ratio of 16 to 1, which will give a range of 75 feet minimum to 1200 feet per minute maximum. The maximum speed can be increased to 1800 F.P.M., which will make the minimum speed 115 F.P.M. It is fast, rugged, dependable.

Write us today for detailed information!

DAVIS EQUIPMENT

THE R. L. DAVIS ELECTRIC CO., INC. • WALLINGFORD, CONN.

SPARK TESTERS • SPOOLERS • TAKE-UPS • CAPSTANS

NO. 2,501,339, APPARATUS FOR APPLYING VARNISH TO CONDUCTORS AND SIMILAR ARTICLES, patented March 21, 1950, by John J. Keyes, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, East Pittsburgh, Pa., a corporation of Pennsylvania.

A number of rotating cylindrical wiping members are provided disposed for a limited lateral movement relative to the conductor, and being disposed with their axes parallel to the line of movement of the conductor. The wiping members are guided in an orbit around the conductor.

★ ★ ★

NO. 2,501,372, WIRE FABRIC TIRE CASING, patented March 21, 1950, by Arthur E. Benson, Detroit, Mich., assignor to United States Rubber Company, New York, N. Y., a corporation of New Jersey.

Included are at least two plies of wire fabric, each ply having parallel wire cables embedded in rubber, the wire cables in one of the plies extending at an angle to the cables in the other ply, at least two bead wire bundles, a flipper of wire fabric having parallel wire cables embedded in rubber this flipper being folded around the inner bead bundle and having an end portion extending along the outer ply to a point at least halfway between the bead bundle and tread portion, the end of the outer ply being folded around said flipper and the inner bead bundle, and a second flipper of wire fabric folded around the outer bead bundle, the end of the inner ply being folded around both of these bead bundles and the second of the flippers.

★ ★ ★

NO. 2,501,481, APPARATUS FOR TESTING CABLE ELEMENTS, patented March 21, 1950, by Dawson M. Taggart, Ruxton, Md., assignor to Western Electric Company, Incorporated, New York, N. Y., a corporation of New York.

More specifically this is an apparatus for electric testing of continuously-advancing cable cores which cores consist of a filamentary central conductor having insulating discs spacedly positioned thereon.

★ ★ ★

NO. 2,501,482, ELECTRICAL TESTING APPARATUS, patented March 21, 1950, by Wentworth D. Boynton, Woodbrook, Md., and Joseph E. Schober, Chicago, Ill., assignors to Western Electric Company, Incorporated, New York, N. Y., a corporation of New York.

Here the core consists of central conductor with insulating discs spacedly positioned thereon.

★ ★ ★

NO. 2,501,634, HELIX OF METAL WIRE FOR USE AS FISHING SINKERS AND FOR OTHER PURPOSES, patented March 21, 1950, by Thomas M. Rector, Morristown, N. J.

The sinker comprises a helix of flexible non-resilient metal wire, the maximum ratio of the outside diameter of the helix to the diameter of the wire being 2 to 1 and the range of the ratio of the pitch of the helix to the diameter of the wire being within the limits of 1.25 to 1 and 2 to 1, whereby the convolutions are spaced axially and provide between them a spiral groove into which the fishing line can be round for attachment to the sinker, the free ends of the flexible metal wire being deformable inwardly into tight engagement with said line to prevent unwinding thereof and to hold the sinker against slipping on the line.

★ ★ ★

NO. 2,502,005, APPARATUS FOR MANUFACTURING TAPERED WIRES AND TAPERED STRIP MATERIAL, patented March 28, 1950, by Clarence W. Hansell, Port Jefferson, N. Y., assignor to Radio Corporation of America, a corporation of Delaware.

Longitudinally tapered wires are produced by the machine which comprises a pair of rotatable devices upon which the wire stock is moved, a heater intermediate the rotatable devices to heat the stock, and means coupled to the rotatable devices to apply a force to variably stretch and to longitudinally taper the stock as it passes from one rotatable device to the other.

★ ★ ★

New Use for Wire

THE unique idea of applying high tensile wire to form a

FISKE'S LUBRICANTS

RESULT IN BETTER

WIRE DRAWING

If you are drawing *copper, brass, aluminum, stainless steel* or other *alloy wires,* there is a FISKE product for each of your special requirements.

A FISKE wire drawing lubricant will give you improved finishes, keep dies cleaner, increase die life and reduce your wire manufacturing costs. Try them!

FISKE WIRE ROPE LUBRICANTS for pre-fabrication and field use are scientifically compounded for wire rope use. They are water-repellant, impervious to gases and chemical fumes, give maximum protection against corrosive elements and preserve the core under all operating conditions.

Write today to Fiske Brothers Refining Co., 143 Lockwood St., Newark 5, N. J., or 1514 Oakdale Avenue, Toledo 5, Ohio.

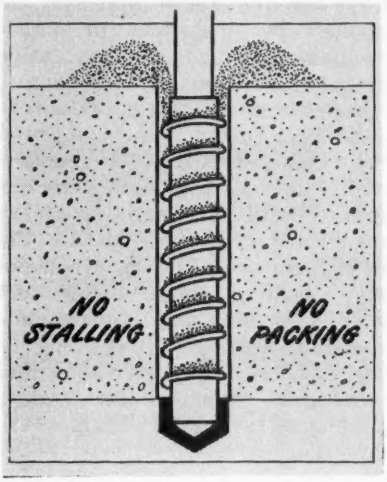
FISKE'S

Established 1870

METAL WORKING LUBRICANTS

"live-spiral" flute on the shank of a carbide masonry drill promises to alter, simplify and reduce time and cost in the drilling of holes in masonry, brick, tile, concrete and similar materials.

★ ★ ★



Carboloy's New Drill.

ANNOUNCED by the **Carboloy Company, Inc.,** Box 237 — Roosevelt Park Station, Detroit 32, the new drill development is claimed to represent the greatest single advance ever seen in carbide tipped masonry drills.

★ ★ ★

NOT only does the new drill cut faster, but it keeps right on going deeper with greater ease than with conventional types of drills. There is no necessity for withdrawing the drill to remove dust from the hole because the "live-spiral" flute cleans the hole while the hole is being drilled.

★ ★ ★

Bulletin Describes New Corrosion Resistant Pump

NUKEM PRODUCTS CORPORATION, Buffalo 20, N. Y., has developed a new compact corrosion resistant pump especially designed for plating and pickling solutions that operates at high efficiency. It has no metal in contact with the carried solution and can alternately handle acids, alkalis or solvents.

★ ★ ★

THE bulletin describes the Nu-Kast No. 166 pump, a ½ H.P. unit that will circulate 90 gallons per minute on a five pound head. It has been in use in a number of plants for periods up to a year with eminent satisfaction. Furnished with or without motor. Shipping weight with motor, 100 lbs. Its construction completely eliminates the use of stuffing boxes. Other sizes are built that will handle larger volumes of solutions.

★ ★ ★

PLEASE write for Bulletin A.1 A. 29B-81 for complete engineering data.

★ ★ ★

ADVERTISING is a service to a magazine's readers. Methods, materials, and machinery were developed under the stress of war. Both editorial matter and advertisements keep you informed on what is happening in industry.

WIRE SPOOLS, ALL-STEEL, LITHOGRAPHED

Ends and traverses may be shipped separately and assembled easily in your plant on a hand, foot, or power press.

5" and 6½" diameter ends with 1-15/16" diameter traverses.
10½" diameter ends with 3½" diameter traverses.
Traverse lengths up to 12".

J. L. CLARK MANUFACTURING CO.
600 23rd AVENUE • ROCKFORD, ILLINOIS

Pre-Paint Cleaner Performs Three Jobs

HOW a new pre-paint metal-cleaning material, Oakite Compound No. 33, (1) removes oil, (2) removes rust and (3) prepares metal for paint in a single operation, is described in a special Service Report just issued by **Oakite Products, Inc.**

★ ★ ★

SERVICE Report describes No. 33 as having solvent and detergent properties that are extremely effective in removing stamping and forming oils, rust preventives, carbon smuts, soldering and welding fluxes, identification inks and similar soils. The material contains acid ingredients that act on rust, heat scale, tarnish and other oxides, has accelerating agents that make rust and oil removal a fast operation, has the ability to convert the surface layer of metal into a thin film of insoluble phosphates, which provides an excellent bond for paint. It has similar etching and conditioning action on aluminum sheets and castings.

★ ★ ★

IN shops where the type of work precludes the use of automatic, spray-type washing equipment, Compound No. 33 answers the need for a material that may be applied by soak-tank or hand-swabbing methods. In extensive tests in metal-working plants, where incoming steel is often considerably rusted, the compound has demonstrated such marked ability in removing both rust and grease that it has been possible, in many instances, to eliminate the need for a cycle of separate cleaning, pickling, neutralizing and paint-conditioning operations. Readers desiring a free copy of the Service Report providing full particulars should address Oakite Products, Inc., 152A Thames St., New York 6, N. Y.

★ ★ ★

Die Chart Available

A NEW chart—for quickly determining Carboloy die meeting point diameter—was developed in connection with the recently announced Carboloy line of improved standard rough-cored dies, which feature a built-in back-relief.

★ ★ ★

SINCE the new dies incorporate a 90° back-relief (included) angle, rather than the 30° angle which was previously recommended, the chart formerly used is now obsolete.

★ ★ ★

THE new chart may be inserted over the old one, on page 61 of the Carboloy Die Service Manual, No. D-119. The new dies will eliminate the time previously required to cut in the back-relief angle. They are also designed to eliminate certain die failures occasionally caused by inadequate or improperly ground back-relief.

★ ★ ★

IF you do not have a copy of the chart calculator, please write **Carboloy Company, Inc.,** Detroit 32, Mich.

★ ★ ★

Give your Production a New Twist!
NEBUTT CO
HERE'S THE HIGH SPEED BUNCHER FOR
FAST, ECONOMICAL TWISTING OF SMALL WIRES
Check these big features:
Two twists produced at each revolution
Accommodates standard shop reels up to 24" dia. x 12¾" O.A. width
Double drum grooved capstans
Quick acting electrically operated brakes
Push button control station
Substantial guards and safety features
Anti-friction bearings
Rugged construction with low center of gravity
Butt High Speed Bunchers are made in two sizes: S-31 for strands up to No. 14; S-35 for strands up to No. 8. For further details write for Circular No. 63.
NEW ENGLAND BUTT COMPANY
Established 1842
304 PEARL STREET • PROVIDENCE 7, R. I., U. S. A.

Steelskin Literature Available

THE R. H. MILLER COMPANY, INC., of Homer, New York, has available for distribution an interesting article entitled "Metal Drawing Lubricants" by the company's General Manager, **Walter A. Smigel.** This article reviews the early developments of the company and its research work.

* * *

THE company manufactures a variety of lubricants for metal drawing and metal processing. These products are known throughout industry by the trade name "STEELSKIN." The article describes briefly the various practical applications of the "STEELSKIN" products for both wet and dry drawing of ferrous and nonferrous metals; as well as metal coatings and "STEELSKIN" inhibitors.

* * *

AS the R. H. Miller Company, Inc. has been operating successfully since 1909, its research department has available a wealth of performance data on the practical application of "STEELSKIN" lubricants. These data and engineering service are available to all industries in reducing cost and improving quality of cold drawn products. The article can be secured by writing the R. H. Miller Company, Inc., Homer, New York.

* * *

Electronic Uses of Nickel Shown At Radio Engineers Show

THE many electronic uses of nickel and nickel alloys are demonstrated at the Radio Engineers Show held at Grand Central Palace in March, at the International Nickel booth. Among the exhibits was a skeleton of the largest thyratron, or radar pulse, tube in the United States.

* * *

A COPPER-CORED nickel wire was shown which has 70 per cent of the electrical conductivity of copper, with greater strength and toughness as well as other properties that fit it for use where exposed copper wire is not desirable. Also a vacuum tube was exhibited which is used to measure a vacuum and a resistance type of soldering iron which has cut production costs in the manufacture of radio and other electrical equipment. Other items include a rustproof, collapsible television antenna and parts of two-way radio sets.

* * *

New Chain Belt Bulletin

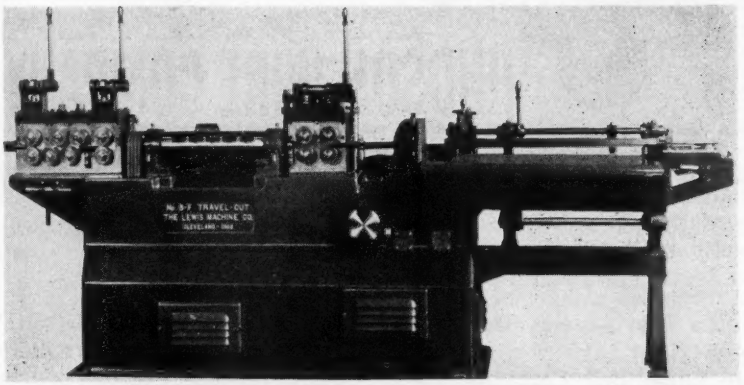
CHAIN BELT COMPANY of Milwaukee has just published Bulletin No. 49-30 describing and listing with prices Rex Stock Size Cast Sprockets for the complete line of Rex Drive and Conveyor Chains.

* * *

DIMENSIONS. specifications, sprocket styles and other necessary information are included,

CUT YOUR CUTTING COST WITH

LEWIS **TRAVEL-CUT**



Wire Straightening & Cutting Machines

The simplicity of design and rigid construction of the Lewis Travel-Cut makes it well suited for the most severe high-production requirements. This machine feeds the wire from the coil, straightens, gauges to accurate length, and cuts while in motion thus producing uniform diameter rod free of arbor swell and feed roll marks. It is particularly adapted to precision work on bright finished steel, brass, aluminum, stainless, and alloy wire. This method of cutting is also very efficient for short lengths such as welding rod, special bolts, etc., and increases the over-all efficiency approximately 20% over the conventional type of cut-off.

Machines built in various sizes to handle from 1/16" up to 3/4" diameter, and 1/16" to 5/8" square or equivalent area in hexagon and flat.

Exclusive Representatives

EAST: Penn Machinery Co., 117 North Third Street, Philadelphia 6, Penn.

MIDDLE WEST: Steel & Wire Machinery Co., 1017 Helmsdale Rd., Cleveland 12, O.

CENTRAL: Moslo Machinery Co., 2443 Prospect Avenue, Cleveland 15, Ohio.

WEST COAST: Hoffman & Heartt, 3005 So. Grand Ave., Los Angeles 7, California.

CANADIAN: Empire Engineering Co., 11 Wellington St. E., Toronto 1, Ontario.

CONTINENTAL EUROPE: Gaston E. Marbaix, Ltd., Devonshire House, Vicarage Crescent, London S. W. 11, England.

The LEWIS MACHINE Company
3441 E. 76th Street, Cleveland 4, Ohio

Also agents in Paris, Stockholm, Rotterdam, Brussels, Zurich, Milan, Bombay and Melbourne

WIRE
Made to Your Order

• Here are (1) Engineering and research facilities to work on your particular wire problems; (2) Production geared to any quality and quantity desired; (3) Unsurpassed craftsmanship; and (4) Wire that's made right • Let us quote!

YOUR PRODUCT

HUDSON WIRE

Partial List of Products..

Bare Wire (Hudson Wire Division):
Copper. Brass. Bronze. Zinc. Silver-plated. Tin. Phosphor-bronze. Nickel. Silver. Cadmium. Specialty Wires.

Insulated Wire (Winsted Division):
Enameled. Litz. Cement-coated. Enameled. Cotton. Silk. Celanese. Glass-fibre. Enameled Aluminum. Formvar. Loop Wire. Etc

Winco — Trade Hudco Mark — Fine Wire Manufacturers

One of the Oldest Fine Wire Companies in America

HUDSON WIRE COMPANY

GENERAL OFFICES: OSSINING, N.Y • WINSTED DIVISION: WINSTED, CONN.

together with rules for selection, alignment and care of sprockets and information on what should be included when ordering sprockets.

★ ★ ★

FOR a copy of this Rex Stock Size Cast Sprocket bulletin, write Chain Belt Company, 1600 West Bruce Street, Milwaukee 4, Wisconsin, and ask for bulletin No. 49-30.

★ ★ ★

New Corrosion-Resisting Coating Material

THE ELECTRO CHEMICAL SUPPLY & ENGINEERING CO., 750 Broad Street, Emmaus, Pa., announces an entirely new and different type of thermo-setting resin used as an acid and alkali-proof cement or coating, called DURON.

★ ★ ★

DURON is remarkable in that it will adhere without the use of a Primer to concrete or metal, and is self-hardening at room temperature. The novel adhesive properties of DURON are due to the fact that, unlike thermo-setting cements and coatings heretofore produced, DURON is not derived from phenolic or furfuryl alcohol resins.

★ ★ ★

IT is used in the manufacture of acid and alkali-proof cements for joining brick and tile, as a coating for concrete, steel, or wood, and as an impregnant for wood. Useful materials may be produced by mixtures with metal powders, asbestos, cork and other insulating materials.

★ ★ ★

IT is inert to solvents, fats, oils, greases, alkalis of all concentrations, and to a wide range of acids.

★ ★ ★

When you write an ADVERTISER for prices and information, PLEASE MENTION the fact that you saw his ad in WIRE AND WIRE PRODUCTS. It identifies your inquiry and expedites service.

DAVIS-STANDARD
Insulating Machines

Clean head design and accurate temperature control in these Davis-Standard Insulating Extruders assures wire concentricity. Machines for rubber and thermoplastics, including Nylon; continuous vulcanizing insulating machines; wire handling equipment. Extruding Machines for rods, tubing, profiles, straining, Nylon covering of wire rope.

Complete Engineering and Manufacturing Facilities for Your Most Critical Demands.

THE STANDARD MACHINERY COMPANY, MYSTIC, CONN., U.S.A.

Established in 1848 *Incorporated in 1875*

Pacific Coast Representative:
W. H. DEL MAR COMPANY
5140 CRENSHAW BLVD., LOS ANGELES, CALIFORNIA

2" Davis-Standard Thermo-Plastic Extruding Machine

New Products Announced by Holden

THE A. F. HOLDEN COMPANY of New Haven, Connecticut and Detroit, Michigan, announces the manufacture of a Soluble Oil Clarifier. The use of this clarifier eliminates the rancid effect in soluble oils and is simple to use. To control the amount required is easy by the use of ph papers in a range of from 9½ to 10. Rancid oil usually has a ph range of from 6 to 8½. The use of the material controls the alkalinity and eliminates the toxic elements which cause the oil to become rancid.

★ ★ ★

THE company also announces a new low cost blacking process. The weight of chemicals per gallon of water solution is 3 pounds versus 7 to 10 pounds of the conventional water solution blacking salt. The process, as developed, is designed for blacking stainless steels cast iron, malleable iron, as well as SAE or any steels. The process may be used in equipment already installed and the only variance in the process is the use of a new chemical cleaner which prepares the metal surface to obtain a uniform black.

★ ★ ★

New Vinyl Resin Announced

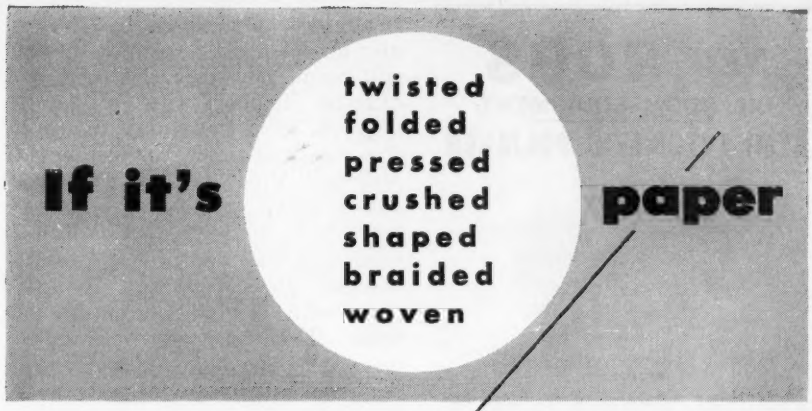
DEVELOPMENT of a new easy-processing vinyl resin for use in the manufacture of electrical wire and cable and other plastic products, was announced recently by **Naugatuck Chemical division, United States Rubber Company.**

★ ★ ★

KNOWN as Marvinol VR-20, the new resin is the second step in a long-range program to market a complete line of vinyl resins. This vinyl resin is outstanding because of its high molecular weight, purity and fine particle size. Products in which it is used exhibit good toughness, durability, heat and light stability.

★ ★ ★

IN the calendering field, the new resin will eliminate or dras-



TWITCHELL makes it

treated braiding and wrapping yarns

treated wire-rope cores

slit kraft or jumbo rolls for crushing and wrapping operations.

waxed cable-fillers for 2- and 3-wire non-metallic sheathed cable, varnished cambric, and shipboard cable.

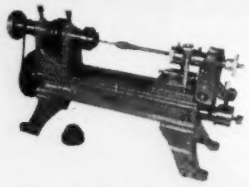
E. W. TWITCHELL INC.
Third & Somerset Streets
Philadelphia 33, Pa.

NORBIDE Abrasive: Effective, Economical

This abrasive—second only to the diamond in hardness and 150 times less expensive—does an efficient job of cutting and semi-finishing cemented carbide wire drawing dies.

NORTON CO. — Worcester 6, Mass.

NEW ROOS
DIE ROOM EQUIPMENT
SEMI-AUTOMATIC POLISHER



MODEL OT - PATENT REGISTERED AND APPLIED FOR

Note these outstanding features for greater accuracy in polishing dies and for prolonged machine life!
(a) Quick opening spindle
(b) Pressure adjustor
(c) New cam assembly
(d) New style leather belt

NEW STYLE TAILSTOCK
To Fit Other Model
ROOS Polisher Model OT

MODEL OT

You can quickly and easily replace the tailstock on your old Roos Semi-Automatic Polisher with the New Model OT-Tailstock. Quotation on this new Tailstock furnished on request.

ROOS
AUTOMATIC DIE SHAPING MACHINE

MODEL DS-3A

Offers you three improved features: a die rotating attachment; a time switch; and a reversing switch—which provide these advantages:

1. Die rotating attachment and time switch eliminate the formerly necessary constant attention by operator. Rotation of die is automatic, and machine shuts off automatically at end of time cycle.
2. Reversing switch permits rotation of the die in either direction.

Write today for full information!

ROOS TOOL
& MFG. COMPANY
17-19 Grove Street
Montclair, New Jersey

tically reduce the need for copolymer processing-aid resins. Its use will permit lowering Banbury and calender temperatures 10 to 15 degrees below previous practice, the company said. Extrusions of Marvinol VR-20 compounds have shown excellent gloss at temperatures 10 to 20 degrees below those used with most proprietary resins and its gloss retention is good even with a high percentage of filler. The resin may be handled on conventional vinyl-processing equipment. No special machinery is needed for mixing, extruding, calendering or molding.

★ ★ ★

PRODUCTION of Marvinol VR-20 is now underway at the Naugatuck Chemical division's plant in Painesville, Ohio.

★ ★ ★

New Humidity-Temperature Instrument

THE ABBEON SUPPLY COMPANY, 58-10 41st Drive, Woodside, New York City, distributors for the Friez Instruments of The Bendix Aviation Corp., announces that a new humidity and temperature indicator to be called the "Hygrodial" is now coming off the production lines after exhaustive field and laboratory tests. It is a direct reading instrument which shows at a glance the relative humidity and temperature of the air to which it is exposed.

★ ★ ★

THE instrument is 5⅜" long, 3⅝" high and 1-11/16" deep, weighs 9 ounces and sells for $18.00. It is designed primarily for use in industrial plants.

★ ★ ★

New Hospital Use for Wire Baskets

NURSE Beatrice Finnegan, of the Halloran VA Hospital, Staten Island, N. Y. can be credited with developing a new use for wire baskets for hospital use. Wire basket carriages such as are used in self service supermarkets were installed in the hospital recently for the purpose of hauling institutional and medical supplies. Miss Finnegan has charge of the paraplegic ward.

★ ★ ★

HAVE YOU INVESTIGATED
THE PRICE OF TIN
LATELY?

There's no substitute for tin... for instance, take Stannochlor (anhydrous stannous chloride)—one of the many unusual tin chemicals developed through Metal & Thermit's specialized tin research.

STANNOCHLOR
IS STABLE —so enables large quantity purchasing. Does not deteriorate with age.

STANNOCHLOR
IS CONCENTRATED contains no water of crystallization —so goes farther per pound.

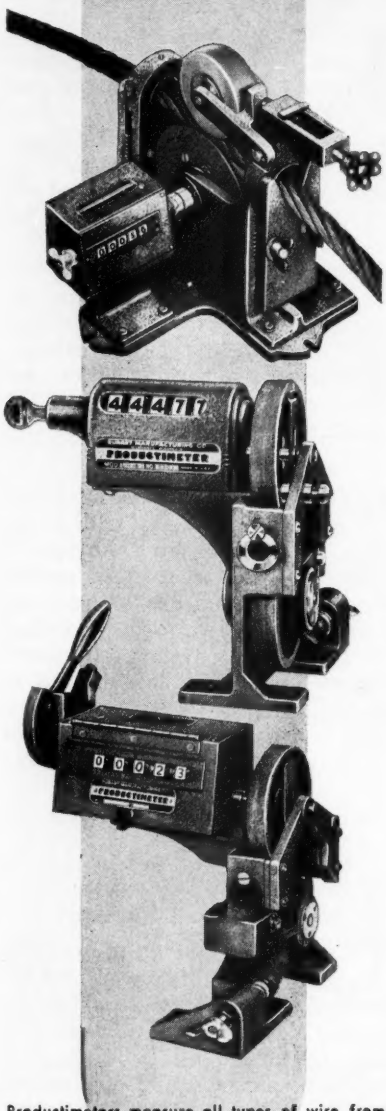
STANNOCHLOR
IS ADAPTABLE —so offers versatile assistance. Among its many uses to date: Production of dry colors and pigments . . . in immersion tinning processes . . . as a catalyst in organic reactions . . . as an analytical reagent.

STANNOCHLOR IS BACK — AND BELONGS IN YOUR PICTURE

METAL & THERMIT CORPORATION
100 EAST 42nd STREET, NEW YORK 17, N. Y.

Specialists in Tin

PRODUCTIMETER
WIRE MEASURING MACHINES
Fast . . Accurate . . Dependable . . Legible



Productimeters measure all types of wire from .010 to 3½ inches in diameter . . . at speeds up to 5,000 feet per minute. They eliminate "guess-work". . . insure profitable operation in your plant.

Send for Catalog No. 40

DURANT MFG. CO.
1918 N. Buffum St. Milwaukee 1, Wis.
118 Orange St. Providence 3, R. I.
Representatives in Principal Cities

PRODUCTIMETERS
SINCE 1879 *Speedometers* OF INDUSTRY

Water Conservation Study

THE growing scarcity of water throughout the country and the need for conserving it has led to the establishment of a new board of seven men called **"The President's Water Resources Policy Commission,"** with offices at 718 Eighteenth Street, N. W., Washington 25, D. C. **Morris L. Cooke** is the chairman.

★ ★ ★

THE water resources of the nation vary widely in different localities and change from time to time in keeping with industrial changes. The fact that in some parts of the country water supply has become a critical consideration has led the board to seek voluntary expressions from those who may have considered the problem.

★ ★ ★

IF any of our readers have made studies of the subject or have constructive suggestions as to how the problem in their communities may be met, this cooperation will be appreciated by the board. Your comments will be welcomed by it. The board was established under Executive order 10095.

★ ★ ★

Fork Truck and Pallet System Cuts Keg Breakage 40% at J. & L.

THE JONES & LAUGHLIN STEEL CORPORATION, by installing a pallet system, two 4,000-lb. capacity fork trucks, and three pallet-type Worksavers, has cut keg breakage 40%, made it possible to tier kegs 8 high, and eliminated manual stacking operations at its Aliquippa, Pa. nail warehouse.

★ ★ ★

UNDER the new system, kegs are placed on a gravity roller-conveyor after the heads have been nailed, and are taken off and palletized as they travel down the conveyor. 48 x 48-inch pallets are used and 16 kegs make one layer on the pallet. Two pallets, separated by a plywood sheet for load stability, are loaded onto each pallet. Kegs weigh 100 lb. each, giving the loaded pallet a weight of 3200 lb.

★ ★ ★

RODINE
STANDARD PICKLING PRACTICE
THE WORLD AROUND

Rodine®

Selective Inhibitors

used in the Pickle Bath

- ***Saves both acid and metal, cuts pickling costs.***
- ***Promotes scale removal.***
- ***Prolongs the life of the pickle bath.***
- ***Prevents over-pickling.***
- ***Minimizes hydrogen embrittlement.***
- ***Improves pickling . . . gives a brighter, cleaner, smoother surface.***
- ***Reduces acid fumes.***
- ***Improves working conditions.***
- ***Permits close control of pickling operations.***
- ***Boosts pickling production.***

Send for further information about RODINE and how it can help your own pickling production.

AMERICAN CHEMICAL PAINT COMPANY
AMBLER, PENNA.

From this new, modern plant come

PHILIPS *Master-Made* DIAMOND DIES

Into this modern plant at Valkenswaard, the Netherlands, we recently moved our master craftsmen and the precision machinery upon which the international reputation of PHILIPS Diamond Dies has been painstakingly built.

The inseparable and indispensable ingredients of scientific knowledge and highly developed craftsmanship continue to be the basis of these truly superior Diamond Dies.

Available domestically under the trade name

***Norelco* DIAMOND DIES**

Many years' experience in producing precision Diamond Dies is your assurance that in NORELCO, only perfect dies reach you. Users acclaim the consistently high quality of these dies . . . enabling the production of drawn wires from .000275 to .100 at rock-bottom cost. Let us consult with you on your diamond die problems, *today!*

NORTH AMERICAN PHILIPS COMPANY, INC.

Dept. FE-5, 100 East 42nd Street, New York 17, N. Y.

SAN FRANCISCO, JUNE 16th

PACIFIC COAST REGIONAL MEETING

of the

WIRE ASSOCIATION

Make your plans to attend now!

See Page 383 for details.

All wire mill men are invited to attend whether or not they are members of the Wire Association

Make your reservations to

RICHARD E. BROWN, Executive Secretary

THE WIRE ASSOCIATION

300 MAIN STREET STAMFORD, CONN.

AFTER palletizing, a fork truck picks up and transports the load to storage. The telescopic truck tiers pallet loads four high to make maximum use of overhead space. A metal guard is constructed over the operator's head to prevent injury in the event that a keg should fall.

* * *

BEFORE adopting the fork truck and pallet system, kegs were delivered by a conveyor system throughout the warehouse. Stacking and unstacking were by hand. Kegs could not be stacked as high as at present, and stacking and unstacking were accomplished by physical effort alone. Now no physical effort is required. The operator stacks and unstacks by operating his truck. In addition to high stacking and less keg breakage, the operator's work is safer and easier, and more kegs are handled in less time.

* * *

NAILS are shipped by rail, truck and barge. Fork trucks remove pallet-loads from storage in quantities to fill customers' orders and deliver them to the railroad siding or highway-truck loading platform adjacent to the warehouse. Here the palletized load is placed on top of two empty pallets in the box car or truck to give a convenient unloading height. Kegs are removed and placed on their bilge across the car width for shipment.

* * *

New Chemical Catalogs

TWO new catalogs describing products manufactured by **Glyco Products Co., Inc.**, Brooklyn, N. Y., and Natrium, W. Va., are available upon request. They give chemical, physical and application data, and are designed to help industry solve raw material problems and lower manufacturing costs. They are:

Esters by Glyco — 24-pages of specification and application data on a sizeable number of polyhydric alcohol fatty acid esters.

Synthetic Waxes by Glyco — 18-pages of facts, figures and specifications on Glyco's synthetic waxes.

* * *

SALES UP 250%
SINCE 1947!

There MUST Be A Reason—

WHY MORE AND MORE INSULATED WIRE MANUFACTURERS USE NEW ENGLAND LACQUER

—And There Is!

1947 1948 1949 1950

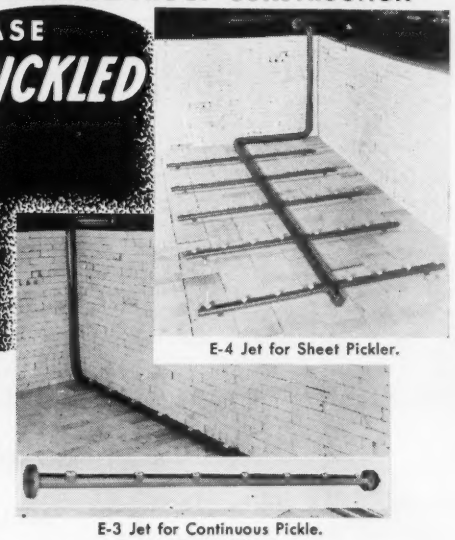
NEW ENGLAND LACQUER
. . . is tailor-made to your special requirements! Heat-Resistant—Flexible — Flame-Proof — Clear — High Dielectric Retention.

Consult us on all coating problems.

NEW ENGLAND LACQUER CO.
KING PHILIP ROAD
EAST PROVIDENCE, R. I.

• SPECIALISTS IN *CHEMICAL-PROOF* CONSTRUCTION

INCREASE TONNAGE PICKLED WITH Heil STEAM Jets



E-4 Jet for Sheet Pickler.

• Reports show increases in tonnage pickled from 20% to 40%. Savings in acid consumption also reported.

E-3 Jet for Continuous Pickle. Insert; Flanged Section.

Our complete series of jets have been designed to give thorough heat and agitation to any or all parts of the pickling vat. Write Dept. J for free Bulletin No. 43.

PICKLE TANKS • HEATERS • CRATES

Heil PROCESS EQUIPMENT CORP.
Formerly Heil Engineering Company
12901 ELMWOOD AVE. • CLEVELAND 11, OHIO

Durant Issues New Catalog

A NEW catalog, No. 75, just issued by the **Durant Manufacturing Company** of Milwaukee, Wisconsin, illustrates and describes their very latest Productimeter Stroke, Rotary, and Pick Printing Counters. The catalog gives specifications, information on forms and operation, and explains the advantages of application on production machines. The various styles of Productimeter Printing Counters provide both visual and recorded count. To obtain a copy, write the company, 1918 No. Buffum Street, Milwaukee 1, Wisconsin.

★ ★ ★

New Plant for Potter Instrument Company

POTTER INSTRUMENT COMPANY, INC. is transferring its operations to a newly constructed plant at 115 Cutter Mill Road, Great Neck, L. I.

★ ★ ★

THE company, formerly located at Flushing, N. Y., manufactures high-speed electronic counters, precision counter-chronographs, electronic computers and associated equipments.

★ ★ ★

THE new plant, of modernistic design, contains double the floor area of the former location. The sales, research and manufacturing departments will all be centered at this new location.

★ ★ ★

Hartley Issues Booklet Marking 100th Anniversary

THE HARTLEY TOOL and DIE COMPANY, Thomaston, Conn., has just published a beautiful booklet entitled "One Hundred Years" in commemoration of their hundredth birthday this year. The booklet traces the development of the company from its modest beginnings in 1850 to its present husky stature.

★ ★ ★

Diamond Distributors Inc.

MANUFACTURERS OF

PRECISELY GRADED

DIAMOND POWDER

SERVING INDUSTRY'S

SPECIALIZED NEEDS

MEMBER

40 West 40th Street • New York 18, N. Y.

Yarns for Electric Wire

Proven by wide usage — greater efficiency in Serving and Braiding when packages of Silk, Nylon or Acetate are the product of our mills.

Producers also of Tracer and Marker Trams that meet Underwriters' Laboratory Specifications.

Consult us on your specific problems.

Belding Corticelli

Industrial Yarn Division 119 West 40th St., New York 18, N.Y.

THE company specializes in tungsten carbide tools, dies and parts of many kinds. They will be glad to send their commemorative booklet to any of our readers upon request.

★ ★ ★

New Type Cable for Buildings Developed

A-Z Cable, representing the most outstanding development in wiring materials in the past 25 years, which has been thoroughly tested, approved and listed by the Underwriters' Laboratories, has been developed by the Plastic Wire & Cable Corporation of Jewett City, Connecticut.

★ ★ ★

THE many shortcomings of previously available wiring materials have been eliminated in A-Z Cable through radically different design and use of the latest developments in plastic materials and glass fibers. Moist or wet conditions, corrosive atmospheres, temperature extremes, weathering, fungus growth, fibrous coverings, messy finishes and bulky constructions are no longer necessary.

★ ★ ★

THE special plastic insulation, the sheath on A-Z Cables and the glass fiber reinforcement are excellent dielectric materials. From the copper conductor to the outside surface **all** materials function as an extra "safety-factor" electrical insulation as well as tough, durable armor.

★ ★ ★

LABORATORY tests on A-Z Cable revealing its unique properties have been thoroughly confirmed by field tests under very severe service conditions ranging from 44° below zero in northern climates to tropical applications which proved it universally applicable.

★ ★ ★

A-Z Cable takes 50% less space than conventional wiring materials. The elimination of saturated fibrous coverings provides a clean, smooth cable covering. It is good for both overhead and underground installations.

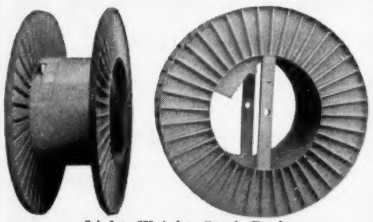
★ ★ ★

"Report On Reels"

THE GEORGE EVANS CORPORATION, Moline, Illinois, manufacturer of light-weight steel reels, has just published a new booklet which presents the Toroidal Reel as the modern answer to a common problem among shippers and users of Electric, Telephone and Power Cable.

★ ★ ★

THIS "Report on Reels" spells out the success of a natural economic change from the use of



Light Weight Steel Reels

wood to steel — as demonstrated throughout eleven years' field experience by Western Electric Company. It provides some interesting data on comparative delivery costs and contains an "Economy Guide in Placing Cable Orders," in which the unique design of the Toroidal Reel plays an important part.

★ ★ ★

THERE is a limited supply of these booklets which will be gladly furnished to our readers on request by addressing The George Evans Corporation, 208 South La Salle Street, Chicago 4, Illinois.

★ ★ ★

New Copy of Ropeology Issued

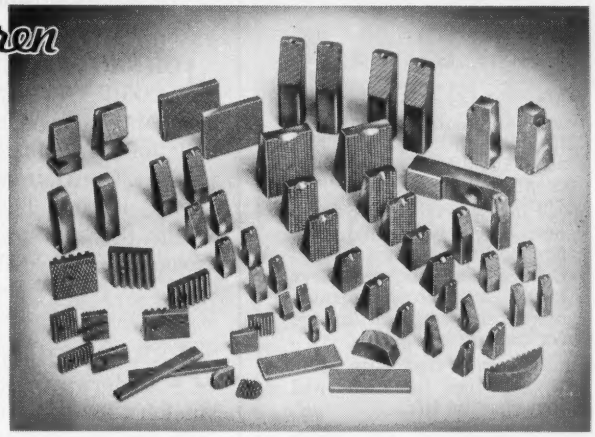
MACWHYTE COMPANY, Kenosha, Wisc., has published a new issue of **Ropeology,** devoted to helpful suggestions on wire rope use and maintenance. Readers are invited to send for a copy. Ask for No. 50-10, Issue 24.

★ ★ ★

Send in
Your Order Now
for the
1950 Wire Buyers Guide

Sjogren

JAWS .... for Wedge Grips, Pullers and Tensile Testing Machines of all makes are available either from stock or manufactured to order. A Sjogren jaw, made to meet your requirements, guarantees you service.



SINCE S&S 1927

Used by Wire Men Who Want the Best!

SJOGREN TOOL AND MACHINE CO., INC.

WIRE PULLERS • WEDGE GRIPS • JAWS FOR ALL MAKES OF PULLERS AND TESTING MACHINES • CAGE ROLLERS • SWAGING HAMMERS • POINTING DIES • WIRE SPOOLERS

14 SWORD STREET
AUBURN
MASSACHUSETTS

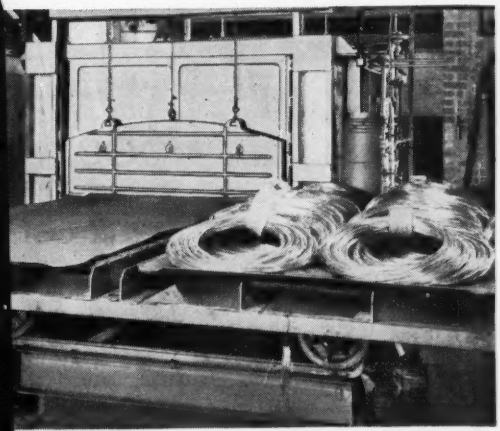
Represented in Canada by THE LARSON CO., 98 Wellington St., West, Toronto, Ont.

ROCKWELL FURNACES

for Annealing Hardening · Drawing · Normalizing Galvanizing and Tinning

Batch or Continuous · Oil, Gas or Electric

Direct Heated Muffle Type Radiant Tube Atmospheres



Gas-fired pan type furnace for annealing 5000 lbs. of medium gauge brass wire; furnace atmosphere controlled to produce oxide-free wire — in many cases practically bright. Other Rockwell furnace types include parallel tube, belt conveyor, pit, hood and others.

ROCKWELL ALSO BUILDS { *Coil winding machines, reels and spools; pickling, brushing, cleaning, washing, finishing, drying and handling equipment; ovens and dryers; special fabrications; non-ferrous rod mills.*

ROCKWELL SINCE 1888 BUILT

FURNACES · OVENS · SPECIAL MACHINERY

W. S. ROCKWELL COMPANY

242 ELIOT STREET · FAIRFIELD, CONN.

In Canada: Francis Hankin & Co., Ltd. Montreal & Toronto

BORAX

More shops are turning to this most satisfactory coating material. It is easy and safe to handle. Does not create dust nuisance.

Pins of wire which have been properly washed after the acid dip, sul coated and then coated with Borax have been satisfactorily drawn after remaining in storage for several weeks.

Borax coated wire used with proper lubricant will increase die life.

Demonstrate the effectiveness of Borax with a fair trial in your own shop as others have done.

Bulletin Submitted on Request

PACIFIC COAST BORAX COMPANY

NEW YORK • CHICAGO • LOS ANGELES

Johnson Making Music Wire from Swedish Rod

JOHNSON STEEL & WIRE COMPANY, INC., of Worcester, Massachusetts announces that all Johnson Music Wire is being made from imported improved Swedish rod. The manufacturers claim this will result in more uniformity and added fatigue properties.

★ ★ ★

ARRANGEMENTS have been underway with Swedish steel makers for some time resulting in the development of an electric furnace steel, the basic material for all Johnson Music Wire. Company officials report that a continuous supply of the new rod is now assured.

★ ★ ★

JOHNSON Music Wire is used to a large extent for small high grade wire springs and wire forms difficult of formation and with exacting service required. Requirements are so diversified that the range of sizes runs all the way from .003", 38,026 ft. to the lb., up to .200", 9 ft. to the lb.

STEEL WIRE

by MAURICE BONZEL

* * *

Translated and Published by

Kenneth B. Lewis

Consulting Engineer

* * *

Price $15.00

* * *

495 pages—414 illustrations

* * *

SEND ORDERS TO

WIRE and WIRE PRODUCTS

300 Main St., Stamford, Conn.

REELS SPOOLS

ALL SIZES

WOOD- PLYWOOD -WOOD-METAL

RETURNABLE NON-RETURNABLE

Samples and Prices on Request

DURKEE MFG. CO. PINE RIVER, MINN.

MODERN

SPOOLERS and COILERS

May improve your efficiency in a long forgotten department. We have developed new designs that may reduce your labor costs considerably. Tell us your spooling problem and we will gladly help you benefit from our experience with no obligation on your part.

BOYD SPOOLERS

Boyd & Sons Mfg. Corp.

1434-38 Callowhill St. Philadelphia 30, Pa.

★ ★ ★

Tool Steel Company Acquires Grinding Concern

THE Pittsburgh Tool Steel Wire Company of Monaca, Pennsylvania, has acquired the Washington Precision Grinding Company, Washington, Pennsylvania, producers of precision ground tool steel flat and square sections. This product complements the line of drill rods and other cold finished fine steels produced by Pittsburgh Tool Steel Wire Company. The machinery and equipment have been removed to the main plant at Monaca and operations are being continued at Monaca.

★ ★ ★

Riverside in Volume Production On Beryllium Copper

NEW techniques for controlling the temper of beryllium copper and maintaining those physical

properties so important to the practical application of the alloy has decided **The Riverside Metal Co.**, Riverside, N. J., to revive its volume production.

★ ★ ★

THIS, coupled with the recent expansion of mill facilities, permits Riverside to offer beryllium copper in wire sizes as small as .020" and rods as large as 2¼" in diameter. Sheet and strip is available in widths up to 8" and thicknesses down to .005".

★ ★ ★

BERYLLIUM copper is a precipitation hardening alloy which has excellent wear resistance and corrosion resistance properties. It is superior to any of the bronzes for mechanical strength after hardening, exhibits resistance to fatigue, particularly corrosion-fatigue and has excellent electrical and thermal conductivities. Creep or hysteresis is the lowest of any commercial copper base alloy and it is easily worked.

★ ★ ★

THE properties and ease of fabrication make beryllium copper an excellent material for bearings, paper making and textile machines, welding electrodes, pen and pencil clips, surgical and dental instruments, pinons and gears, contact brushes, watch and instrument springs, thermostatic diaphragms electrical contacts, current carrying springs and so on.

★ ★ ★

RIVERSIDE specializes in making quality nickel silvers, phosphor bronzes and cupronickel alloys in addition to the beryllium copper.

★ ★ ★

Nopco Chemical Company Forms Pacific Division

NOPCO CHEMICAL COMPANY, makers of a broad line of industrial chemicals, has announced formation of its new Pacific Division. Announcement was made by Nopco president **Thomas A. Printon** from the company's home office at Harrison, New Jersey.

★ ★ ★

SPOOLS... REELS... BOBBINS
● IF IT CAN be wound on a reel, spool or bobbin, Apco Mossberg can fill your needs.
For over 50 years we have specialized in the manufacture of spools and reels of all kinds. Our plant is equipped to manufacture almost any conceivable kind, type and size of steel spool, reel and bobbin, in large quantities or small.
Write for our brochure containing useful information on a wide variety of our spool and reel products.
APCO MOSSBERG CO.
Attleboro, Mass., U.S.A.
Hugh Williams & Co., 47 Colborne St. Toronto, Ontario, Canada
Pacific Coast Representative, Jack P. Williams, Jr., Matson Building, 215 Market St., San Francisco 5, Calif.

MASON
SPOOLS
Why MASON Makes A Top Quality Spool for Less
42 Years of Experience has resulted in improved manufacturing methods.
Thorough Knowledge of Industrial Needs has brought continued customer satisfaction.
Integrated Manufacturing Processes have resulted in production economies.
Mason Spools are available in all standard head and barrel requirements. Get a quote from Mason now!
MASON CAN COMPANY
1949 DEXTER RD., EAST PROVIDENCE 14, R. I.

Simple as A B C
Handle heavy reels easily and safely; remove wire or cable from top or bottom, front or back of reel with
ROLL-A-REEL
Style A: 2,000 lbs. cap. 37.50
Style B: 4,000 lbs. cap. 75.00
F.O.B. Cincinnati
Low slanted front and positive front lock insure quick loading or unloading.
Eliminate jacks, cumbersome handling.
Carried easily to reels, job or storage.
Sold through wholesalers only.
WRITE TODAY FOR DETAILS
ROLL-A-REEL
327 WEST FOURTH STREET
CINCINNATI 2 OHIO

EISLER
RESISTANCE WELDERS
SPOT • BUTT • GUN • SEAM
A complete line of Resistance Welders from ¼ to 300 KVA for all types of welding
GLASS FORMING MACHINES for Ampules, Bulbs, Radio Tubes and Electronic Tubes.
TRANSFORMERS
STANDARD • SPECIAL
Air, Oil, or Water Cooled
Made in sizes from ¼ to 500 KVA
FURNACE • DISTRIBUTION • POWER LIGHTING • PHASE CHANGING • WELDING • ELECTRONIC DEVICES, Etc.
SEND FOR NEW CATALOG NO. TR-50
CHAS. EISLER
EISLER ENGINEERING CO., Inc.
747 So. 13th St. Newark 3, N. J.

Coming Events of the

WIRE ASSOCIATION

May 11th & 12th— Mid-West Regional Meeting, Pere Marquette Hotel, Peoria, Ill.

June 16th— West Coast Regional Meeting, Sir Francis Drake Hotel, San Francisco, Cal.

Oct. 23-26, Incl.— Annual Convention of Wire Association, Lord Baltimore Hotel, Baltimore, Md.

RICHARD E. BROWN, Executive Secretary
300 Main Street Stamford, Conn.

Buy MONTGOMERY Tinsel Wires

TINSEL CONDUCTORS • RESISTANCE TINSEL
TINSEL LAME • • • TINSEL THREADS

Bare electrical conductors and resistance elements wound on reels ready for insulating with plastic, rubber, etc. Available for prompt deliveries.

Lame and thread furnished in large packages for economical and efficient production on high-speed looms.

Send for samples and engineering data.

THE MONTGOMERY COMPANY
25 Canal St., Windsor Locks, Conn. Tel.: Windsor Locks 14

THE WEBB WIRE WORKS

MANUFACTURERS OF
STAINLESS WIRE
NEEDLE WIRE

NEW BRUNSWICK, N. J.

INCORPORATED MARCH 20th, 1906

WE BUY WE SELL

We Pay Highest Prices for Used Machinery

126-REEL CABLING MACHINE

Reel size 16" x 10" . . 2 Sections . . 63 Bays each . . Back section turns in either direction . . Complete in every detail.

PRICED FOR QUICK SALE

All Machines Reconditioned in Our Own Shop

WIRE & TEXTILE MACHINERY INC.
P. O. BOX 436, PAWTUCKET, R. I.

THE functions of this new division will include sales and all other company activities for the eleven westernmost states, California, Washington, Oregon, Idaho, Montana, Arizona, Nevada, Utah, Colorado, Wyoming and New Mexico as well as the province of British Columbia.

★ ★ ★

MR. **PRINTON** pointed out that increased sales in this area, plus the rapid industrial expansion taking place in the west, make it important for the company to establish a permanent base for its operations on the Pacific Coast at this time. Special emphasis will be placed on the company's industrial chemical sales.

★ ★ ★

THE Pacific Division will be headed by **Perc S. Brown,** vice-president, assisted by **Harold A. Swanson** as general sales manager. **Arthur V. Swarthout** will handle the extensive market survey work required. Organization details and arrangements are now being worked out at the company's Harrison office. Until they are complete the company plans no change in its present western sales set-up.

★ ★ ★

F. L. Blodgett Appointed Sales Manager by the Alloy Rods Company

FRANK L. **BLODGETT,** has been appointed sales manager of the Hard Surfacing Division of the **Alloy Rods Company,** it was announced by **E. J. Brady,** president of the company.

★ ★ ★

MR. BRADY said that Mr. Blodgett will be responsible for the distribution of the company's complete line of hard facing alloy electrodes, known as Wear-Arc which are recommended for correcting wear patterns caused by abrasion, corrosion, compression, heat, etc. Mr. Blodgett will also direct the distribution of the company's line of tool steel electrodes.

★ ★ ★

DIAMOND DIES .0006 - .120 DIAMOND POWDER
INDUSTRIAL
AJAX
SUPPLIES INC.
R.R. 4, P.O. Box 66, Fort Wayne, Ind.

NEW ENGLAND WIRE DIE CO.
7 Forsberg St., Worcester, Mass.
EXPERT RECUTTING
DIAMOND DIES, DIAMOND POWDERS
Eastern Representative of
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QUALITY HIGH — COST LOW
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CARBIDE WIRE
DRAWING DIES
RUSCH WIRE DIE CORPORATION
Croton-on-Hudson, N. Y.

Carbide Dies and Wear Parts
for the Wire Industry
ADAMAS Carbide Corporation
HARRISON, NEW JERSEY

DIAMOND CARBIDE
DIES
KELLY
WIRE DIE CORPORATION
19 W. 34th St. New York

DIAMONDS for
WIRE DRAWING DIES
and CUTTING TOOLS
DIAMOND
POWDER
UNIFORM
QUALITY
CHAMPION DIAMOND COMPANY, INC.
551 Fifth Ave., New York 17

DIAMOND DIES
.000's to .102"
For many years . . .
Outstanding in quality,
workmanship and service.
FORT WAYNE WIRE DIE, INC.
2625 E. Pontiac St., Fort Wayne, Ind.

Link-Belt Announces Line of Bearing Positioning Locknuts and Lockwashers

LINK-BELT COMPANY announces the manufacture of a line of bearing-positioning locknuts and lockwashers, specially designed for effectively locking the various makes of ball and roller bearings in correct position on shafts of 5/16 to 7-11/16 inches diameter.

* * *

ADVANTAGES claimed are — precision manufacture to A. B.E.C. and S.A.E. standards; attractive appearance; easy to install and remove; rust-resistant; vibration proof; smooth, burr-free.

* * *

DETAILED dimensions are contained in a 4-page illustrated Folder No. 2348, which will be sent to any interested reader upon request.

* * *

Efficient Heat Exchanger Unit

CARL BUCK AND ASSOCIATES, Essex Falls, N. J., have brought out for the metal cleaning and finishing industry an acid-resisting heat exchanger unit that will handle all acid solutions except nitric and chromic. The exchanger is built in four standard capacities.

* * *

IT is made of CamacKarbate, an impervious graphite, and has been used with marked success in connection with pickling and plating solutions for several years. The heat exchanger is of exceptionally simple and rugged design, powered by a Nu-Kast No. 166, ½ H.P. pump. It saves considerably in the floor space required and will maintain temperatures within close limit and operate for long periods of time without attention.

* * *

FOR full details please address Carl Buck and Associates.

* * *

DIAMOND WIRE DRAWING DIES • DIAMOND POWDERS
GUARANTEED RECUTTING SERVICE
.0004" INDIANA DIES .114"
Quality-Workmanship-Service
For complete information write
INDIANA WIRE DIE COMPANY
314-324 E. WALLACE ST. • FORT WAYNE 5, INDIANA

WAYNE WIRE DIES STAND FOR
QUALITY
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QUALITY
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QUALITY
in both
DIAMONDS AND
WORKMANSHIP
W.W.D.CO. 057
Highest quality dies manufactured for those who produce quality wire. Insist on the name "WAYNE" if you want long die life, high wire production, and good wire.
WAYNE WIRE DIE CO. 200 PENNSYLVANIA AVE., HILLSIDE 5, N. J.
Phone ELizabeth 2-2456 For Prompt Service

TOOLS TALIDE DIES
WEAR PARTS
Talide Metal, the super hard tungsten carbide gives increased production, better finish, less down time and scrap on all wire mill operations.
METAL CARBIDES CORPORATION
YOUNGSTOWN 5, OHIO

WATER PROOF and CREPE PAPER
in rolls of any size for wrapping coils and reels.
CREPE-KRAFT BARREL LINERS
THE CREPE-KRAFT COMPANY
Division of National Waterproof Papers Inc.
Camden, N. J.

WIRE WEAVING LOOMS
FLY SHUTTLE TYPE
for
INDUSTRIAL WIRE CLOTH
BRUCKNER-MITCHELL, INC.
420 W. 45 ST., NEW YORK 19, N.Y.

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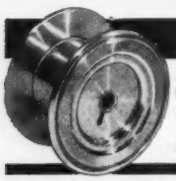
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Government Wire Production Information

(*Continued from page 425*)

tions from many grains varied as the specimen was rotated with respect to the plane of polarization. Since this integrated intensity increased with greater deformation, it appeared that polarized light might be used to detect preferred orientation resulting from such shaping processes as drawing, rolling, and stamping. Preliminary results indicate that the Bureau's method is more sensitive than X-ray diffraction methods for this purpose. Recently it has been found that other cubic metals, such as copper, aluminum, nickel, and alpha iron, can be made optically active. Thus this new application of polarized light can be used in the study of a number of commercial metals.

* * *

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* * *

Acknowledgments

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The author also desires to thank Dr. D. S. Eppelsheimer, Professor of Metallurgical Engineering at the Missouri School of Mines and Metallurgy, for his thoughtful guidance and encouragement during the research and development stages of this work.

* * *

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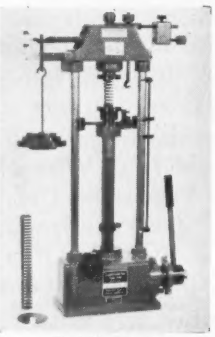

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Indiana Wire Die Co., Ft. Wayne, Ind.
Metal Carbides Corporation, Youngstown, Ohio.
Vascoloy-Ramet Corp., No. Chicago, Ill.

DIES—Diamond
Ajax Industrial Supplies, Inc., Fort Wayne, Ind.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., New York, N. Y.
Champion Diamond Co., New York, N. Y.
Cochaud Wire Die Corp., New York, N. Y.
Ft. Wayne Wire Die, Inc., Fort Wayne, Ind.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
New England Wire Die Co., Worcester, Mass.
North American Philips Co. Inc., New York, N. Y.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIES—Extrusion
Adamas, Carbide Corporation, Harrison, N. J.
Carboloy Co., Inc., Detroit, Mich.
Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
Hartley Tool & Die Co., Thomaston, Conn.
Metal Carbides Corporation, Youngstown, Ohio.
Robertson, John, Co., Brooklyn, N. Y.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.
Wayne Wire Die Co., Hillside, N. J.

DIES—Eyelet
Hartley Tool & Die Co., Thomaston, Conn.
Kelly Wire Die Corp., New York, N. Y.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.

DIES—Pointing
Sjogren Tool and Machine Co., Auburn, Mass.

DIES—Repairs & Re-Cutting
Adamas, Carbide Corporation, Harrison, N. J.
Ajax Industrial Supplies, Inc., Fort Wayne, Ind.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Boulin, Victor J., New York, N. Y.
Carboloy Co., Detroit, Mich.
Champion Diamond Co., New York, N. Y.
Cochaud Wire Die Corp., New York, N. Y.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.
Ft. Wayne Wire Die, Inc., Fort Wayne, Ind.
Hartley Tool & Die Co., Thomaston, Conn.
Indiana Wire Die Co., Ft. Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corporation, Youngstown, Ohio.
New England Wire Die Co., Worcester, Mass.
North American Philips Co., Inc., New York, N. Y.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Wayne Wire Die Co., Hillside, N. J.

DIES—Special Shapes, Etc.
Adamas, Carbide Corporation, Harrison, N. J.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.
Hartley Tool & Die Co., Thomaston, Conn.
Indiana Wire Die Co., Ft. Wayne, Ind.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.

DIES—Swaging
Fenn Manufacturing Co., Hartford, Conn.
Sjogren Tool & Machine Co., Inc., Auburn, Mass.

DIES—Tantalum Carbide
Adamas, Carbide Corporation, Harrison, N. J.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Carboloy Co., Inc., Detroit, Mich.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corporation, Youngstown, Ohio.

WHERE TO BUY, Continued

Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.

DIES—Tube Drawing
Adamas, Carbide Corporation, Harrison, N. J.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Carboloy Co., Inc., Detroit, Mich.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.
Hartley Tool & Die Co., Thomaston, Conn.
Indiana Wire Die Co., Fort Wayne, Ind.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.

DIES—Tungsten Carbide
Adamas, Carbide Corporation, Harrison, N. J.
Balloffet-Vianney Wire Die Co., Inc., Guttenberg, N. J.
Carboloy Co., Inc., Detroit, Mich.
Eastern Carbide Corp., New Rochelle, N. Y.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.
Hartley Tool & Die. Co., Thomaston, Conn.
Kelly Wire Die Corp., New York, N. Y.
Metal Carbides Corp., Youngstown, O.
Rusch Wire Die Corp., Croton-on-the-Hudson, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Wayne Wire Die Co., Hillside, N. J.

DRAW BENCHES—
(See MACHINERY—Draw Benches)

DRUMS—Flange Steel
Hubbard Spool Company, Chicago, Ill.

DRUMS—Vulcanizing
Mossberg Pressed Steel Corp., Attleboro, Mass.
Watson Machine Co., The, Paterson, N. J.

DRYING EQUIPMENT—
Carl-Mayer Corp., The, Cleveland, Ohio.
Drying Systems, Inc., Chicago, Ill.
Industrial Ovens, Inc., Cleveland, Ohio.
Rockwell, W. S., Co., Fairfield, Conn.
Ross, J. O., Engineering Corp., New York, N. Y.

ENGINEERS—Consulting
Wire Mill—Fisher, Edward J. P., North Jackson, Ohio
Lewis, Kenneth B., Worcester, Mass.
Galvanizing—Imhoff, Wallace G. Co., The, Los Angeles, Calif.
Spring Design—Carlson Co., The, New York, N. Y.
Metal Fatigue—Fatigue of Materials Laboratory, Princeton, N. J.

EQUIPMENT—Insulation Testing
Davis, R. L., Elec. Co., Wallingford, Conn.
Entwistle, James L., Co., Pawtucket, R. I.

EYELETS—Brass or Zinc
Platt Bros. & Co., The, Waterbury, Conn.

FENCING & FENCES—Wire
Interlocking Fence Co., Morton, Ill.

FLUXES—Soldering
American Chemical Paint Co., Ambler, Pa.

FOAM PRODUCING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Parkin Chemical Company, The, Pittsburgh, Pa.

FRICTION PAY-OFF STANDS—
Industrial Ovens, Inc., Cleveland, Ohio.

FURNACES—Annealing
Ajax Electric Co., Inc., Philadelphia, Pa.
Carl-Mayer Corp., The, Cleveland, Ohio.
Drying Systems, Inc., Chicago, Ill.
Electric Furnace Co., Salem, Ohio.
Harper Electric Furnace Corp., Niagara Falls, N. Y.
Holden, A. F., Co., The, New Haven, Conn. and Detroit, Mich.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio.
Trauwood Engr. Co., Cleveland, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

FURNACES—Automatic
Carl-Mayer Corp., The, Cleveland, Ohio.
Electric Furnace Co., Salem, Ohio.
Surface Combustion Corp., Toledo, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

FURNACES—Brazing
Electric Furnace Co., Salem, Ohio.
Rockwell, W. S., Co., Fairfield, Conn.

FURNACES—Bright Annealing
Electric Furnace Co., Salem, Ohio.
Harper Electric Furnace Corp., Niagara Falls, N. Y.
Michigan Oven Co., Detroit, Mich.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

FURNACES—Electric
Electric Furnace Co., Salem, Ohio.
Harper Electric Furnace Corp., Niagara Fal's, N. Y.
Rockwell, W. S., Co., Fairfie'd, Conn.
Trauwood Engineering Co., The, Cleveland, Ohio.

FURNACES—Galvanizing Equipment
Ajax Electric Co., Inc., Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio.
Holden, A. F., Co., The, New Haven, Conn, and Detroit, Mich.
Rockwell, W. S. Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio.
Trauwood Engineering Co., The, Cleveland, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

FURNACES—Hard'ing & Temp'ing
Ajax Electric Co., Inc., Philadelphia, Pa.
Carl-Mayer Corp., The, Cleveland, Ohio.
Drying Systems, Inc., Chicago, Ill.
Electric Furnace Co., Salem, Ohio.
Harper Electric Furnace Corp., Niagara Falls, N. Y.
Holden, A. F., Co., The, New Haven, Conn, and Detroit, Mich.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio.
Trauwood Engineering Co., The, Cleveland, Ohio

FURNACES—Lead Melting
Electric Furnace Co., Salem, Ohio.
Robertson, John, Co., Brooklyn, N. Y.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Non-Oxidizing
Ajax Electric Co., Inc., Philadelphia, Pa.
Carl-Mayer Corp., The, Cleveland, Ohio.
Electric Furnace Co., Salem, Ohio.
Holden, A. F., Co., The, New Haven, Conn, and Detroit, Mich.
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Normalizing
Ajax Electric Co., Inc., Philadelphia, Pa.
Carl-Mayer Corp., The, Cleveland, Ohio.
Drying Systems, Inc., Chicago, Ill.
Electric Furnace Co., Salem, Ohio.
Harper Electric Furnace Corp., Niagara Falls, N. Y.
Holden, A. F., Co., The, New Haven, Conn, and Detroit, Mich.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Pot (oil, gas, electric)
Ajax Electric Co., Inc., Philadelphia, Pa.
Holden, A. F., Co., The, New Haven, Conn, and Detroit, Mich.

FURNACES—Resistance Heating, Strand
Trauwood Engineering Co., The, Cleveland, Ohio.

FURNACES—Salt Bath
Ajax Electric Co., Inc., Philadelphia, Pa.
Electric Furnace Co., Salem, Ohio.
Holden, A. F., Co., The, New Haven, Conn, and Detroit, Mich.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Wire, Strip & Sheet
Carl-Mayer Corp., The, Cleveland, Ohio.
Eisler Engineering Co., Newark, N. J.
Electric Furnace Co., Salem, Ohio.
Harper Electric Furnace Corp., Niagara Falls, N. Y.
Michigan Oven Co., Detroit, Mich.
Rockwell, W. S., Co., Fairfield, Conn.
Surface Combustion Corp., Toledo, Ohio.
Trauwood Engineering Co., The, Cleveland, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

GALVANIZING EQUIPMENT—
Steel Equipment Co., Cleveland, Ohio.
Wean Equipment Corp., Cleveland, Ohio.

GRINDERS—Roll
Norton Co., The, Worcester, Mass.

HAMMERS—Swaging
Sjogren Tool and Machine Co., Auburn, Mass.

HOOKS—Pickling & Liming
Lewis Welding & Eng'g Corp., Bedford, Ohio.
Rolock, Inc., Fairfield, Conn.
Youngstown Welding & Engineering Co., Youngstown, Ohio.

HOISTS—Electric Travelling
Cleveland Tramrail Div. of The Cleveland Crane & Engineering Co., Wickliffe, Ohio.
Rolock, Inc., Fairfield, Conn.

INHIBITORS—Pickling
American Chemical Paint Co., Ambler, Pa.
Oakite Products, Inc., New York, N. Y.
Parkin Chemical Company, The, Pittsburgh, Pa.

INSULATING LACQUERING SYSTEMS—Continuous
American Insulating Machine Co., Phila., Pa.
Industrial Ovens, Inc., Cleveland, Ohio.

INSULATING MATERIALS—
Belding, Heminway, Corticelli Co., New York, N. Y.
Glass Fibers Inc., Cleveland, Ohio.
Merrimac Paper Co., New York, N. Y.
New England Lacquer Co., E. Providence, R. I.
Owens Corning Fiberglas Corp., Toledo, O.
Standard Varnish Works, Staten Island, N. Y.
Twitchell, E. W., Philadelphia, Pa.

INSULATING MATERIALS—Paper — For Electric Wire Cable.
Merrimac Paper Co., New York, N. Y.
Twitchell, E. W., Philadelphia, Pa.

LACQUERS—For Electric Wire
New England Lacquer Co., E. Providence, R. I.
Standard Varnish Works, Staten Island, N. Y.

LAME—LAHN—
Montgomery Co., The, Windsor Locks, Conn.

LATHES—Die Reaming
Carboloy Co., Inc., Detroit, Mich.
Roos, Tool & Mfg. Co., Montclair, N. J.

LIME—
Warner Co., Philadelphia and Bellefonte, Pa.

LININGS—Acid and Alkali Proof
Haveg Corp., Newark, Del.
Heil Process Equipment Corp., Cleveland, Ohio.

LOOMS—Weaving Wire Cloth
Bruckner-Mitchell, Inc., New York, N. Y.

LUBRICANTS — For Metal Cutting, Stamping and Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Fiske Brothers Refining Co., Newark, N. J.
Magnus Chemical Co., Garwood, N. J.
Miller, R. H., Co., Inc., Homer, N. Y.
Oakite Products, Inc., New York, N. Y.
Standard Industrial Compounds Co., Inc., Chicago, Ill.

LUBRICANTS—Wire Drawing
(See Compounds—Wire Drawing)

LUBRICANTS—Wire Rope
Fiske Brothers Refining Co., Newark, N. J.
Swift & Co., Chicago, Ill.

LUMBER—Wire Mill, for lagging and car blocking
North Anson Reel Co., North Anson, Maine.

MACHINERY—Armoring (Cable, Wire Hose)
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Barbed Wire
Glader Machine Works, Chicago, Ill.
Wean Engineering Co., Cleveland, Ohio.

MACHINERY—Bead Wrapping
Terkelsen Machine Co., Boston, Mass.

MACHINERY—Braiding
Mossberg Pressed Steel Corp., Attleboro, Mass.
New England Butt Co., Providence, R. I.
Wardwell Braiding Machine Co., Central Falls, R. I.
Wire & Textile Mach'y, Inc., Pawtucket, R. I.

MACHINERY—Brazing
Eisler Engineering Co., Newark, N. J.
Syncro Machine Co., Perth Amboy, N. J.

MACHINERY—Bunching
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

MACHINERY—Bundling, Scrap
Fenn Manufacturing Co., Hartford, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Cable, Electric
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Chain Making
Nilson, A. H. Machine Co., The, Bridgeport, Conn.

WHERE TO BUY, Continued

MACHINERY—Cable, Rope Closing
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Coilers
Boyd & Sons Manufacturing Co., Phila., Pa.
Eisler Engineering Co., Newark, N. J.
Entwistle, Jas. L. Co., Pawtucket, R. I.
Fenn Manufacturing Co., Hartford, Conn.
Morgan Construction Co., Worcester, Mass.
National Machinery Exchange (used), New York, N. Y.
New England Butt Co., Providence, R. I.
Ruesch, H. J. Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.
Watson Machine Co., Paterson, N. J.
Wean Equipment Corp., Cleveland, Ohio.
Wire & Textile Machinery, Inc., Pawtucket, R. I.

MACHINERY—Cold Heading
(See Cold Headers)

MACHINERY—Copper Wire Drawing and Rolling
Aetna-Standard Engineering Co., Youngstown, Ohio.
American Insulating Mach'y Co., Phila., Pa.
Fenn Manufacturing Co., Hartford, Conn.
National Mach'y Exch. (Used), New York, N. Y.
Ruesch, H. J. Machine Co., Newark, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Mach. Co., Waterbury, Conn.

MACHINERY—Covering Wire
American Insulating Mach'y Co., Phila., Pa.
National Erie Corp., Erie, Pa.
New England Butt Co., Providence, R. I.
Royle, John & Sons, Paterson, N. J.
Standard Machinery Co., Mystic, Conn.
Syncro Machine Co., Perth Amboy, N. J.
Wardwell Braiding Machine Co., Central Falls, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Cutting
Eisler Engineering Co., Newark, N. J.
Hallden Machine Co., The, Thomaston, Conn.
Lewis Machine Co., The, Cleveland, Ohio.
Mettler Machine Tool, Inc., New Haven, Conn.
National Mach'y Exch. (Used) New York, N. Y.
Nilson Machine Co., A. H., Bridgeport, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Die Making
Carboloy Co., Inc., Detroit, Mich.
Firth-Sterling Steel & Carbide Corp., McKeesport, Pa.
Kelly Wire Die Corp., New York, N. Y.
Roos, Tool & Mfg. Co., Montclair, N. J.
Wayne Wire Die Co., Hillside, N. J.
Wickman, A. C., Ltd., Coventry, England.

MACHINERY—Draw Benches
Aetna-Standard Engineering Co., Youngstown, Ohio.
Ajax Manufacturing Co., Cleveland, Ohio.
Fenn Manufacturing Co., Hartford, Conn.
Morgan Construction Co., Worcester, Mass.
Ruesch, H. J., Machine Co., Newark, N. J.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Edging
Fenn Manufacturing Co., Hartford, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Enameling
American Insulating Mach'y Co., Phila., Pa.
Industrial Ovens, Inc., Cleveland, Ohio.
Michigan Oven Co., Detroit, Mich.
Syncro Machine Co., Perth Amboy, N. J.

MACHINERY—Extruding
National Erie Co., Erie, Pa.
National Rubber Machinery Co., Akron, Ohio.
Robertson, John, Co., Brooklyn, N. Y.
Royle, John, & Sons, Paterson, N. J.
Standard Machinery Co., Mystic, Conn.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

MACHINERY—Fence
Glader, Wm., Machine Works, Chicago, Ill.
Interlocking Fence Co,, Morton, Ill.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Filament Coil Winding
Eisler Engineering Co., Newark, N. J.

MACHINERY—Flat Wire
Fenn Manufacturing Co., Hartford, Conn.
Ruesch, H. J., Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Galvanizing
(See Galvanizing Equipment)

MACHINERY—Galvanizing Wire
Sleeper & Hartley, Inc., Worcester, Mass.
Steel Equipment Co., Cleveland, Ohio.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, Ohio.
Wilson, Lee, Engr. Co., Cleveland, Ohio.

MACHINERY—Gang Winders
Entwistle, Jas. L. Co., Pawtucket, R. I.
Ruesch, H. J., Machine Co., Newark, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Grinding
Norton Co., The, Worcester, Mass.

MACHINERY—Insulating
American Insulating Mach'y Co., Phila., Pa.
National Erie Co., Erie, Pa.
National Rubber Machinery Co., Akron, Ohio.
New England Butt Co., Providence, R. I.
Royle, John & Sons, Paterson, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Lead Encasing Presses, etc.
Robertson, John Co., Brooklyn, N. Y.

MACHINERY—Lead Stripping
Robertson, John Co., Brooklyn, N. Y.

MACHINERY—Lock Washer
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Looms, Wire Weaving
Bruckner-Mitchell, Inc., New York, N. Y.
Interlocking Fence Co., Morton, Ill.

MACHINERY—Magnet Wire
American Insulating Mach'y Co., Phila., Pa.
Fenn Manufacturing Co., Hartford, Conn.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.

MACHINERY—Material Handling
Cleveland Tramrail Div. of The Cleveland Crane & Engineering Co., Wickliffe, O.

MACHINERY—Measuring Wire & Cable
Durant Mfg. Co., Milwaukee, Wis.
Entwistle, Jas. L. Co., Pawtucket, R. I.
New England Butt Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Nail and Tack
Glader, Wm., Machine Works, Chicago, Ill.
National Mach'y Exch. (Used), New York, N.Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Panning
American Insulating Mach'y Co., Phila., Pa.
Syncro Machine Co., Perth Amboy, N. J.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

MACHINERY—Pickling
Chemsteel Construction Co., Pittsburgh, Pa.
Rolock, Inc., Fairfield, Conn.
Youngstown Welding & Engineering Co., Youngstown, Ohio.

MACHINERY—Pointing
Aetna-Standard Engineering Co., Youngstown, Ohio.
Fenn Manufacturing Co., Hartford, Conn.
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York, N.Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Scudder, E. J., Fdry & Mach. Co., Trenton, N.J.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Poultry Wire Fencing
Interlocking Fence Co., Morton, Ill.

MACHINERY—Rod Mill
Fenn Manufacturing Co., Hartford, Conn.
Morgan Construction Co., Worcester, Mass.
Ruesch, H. J., Machine Co., Newark, N. J.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Rolling Mill
Fenn Manufacturing Co., Hartford, Conn.
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York, N.Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Rubber Insulating
Royle, John & Sons, Paterson, N. J.
Standard Machinery Co., Mystic, Conn.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

MACHINERY—Rubber Tubing and Straining
New England Butt Co., Providence, R. I.
Royle, John & Sons, Paterson, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Machinery Co., Mystic, Conn.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

MACHINERY—Screw Wire
National Mach'y Exch. (Used), New York, N.Y.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Special
American Insulating Mach'y Co., Phila., Pa.
Davis, R. L. Electric Co., Wallingford, Conn.
Emory, Robert J., Co., Newark, N. J.
Entwistle, Jas. L. Co., Pawtucket, R. I.
Fenn Manufacturing Co., Hartford, Conn.
New England Butt Co., Providence, R. I.
Ruesch, H. J. Machine Co., Newark, N. J.
Scudder, E. J., Fdry & Mach. Co., Trenton, N.J.
Sjogren Tool and Machine Co., Auburn, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Machinery Co., Mystic, Conn.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Spooling
American Insulating Mach'y Co., Phila., Pa.
Boyd & Sons Manufacturing Co., Phila., Pa.
Bruckner-Mitchell, Inc., New York, N. Y.
Davis, R. L. Electric Co., Wallingford, Conn.
Eisler Engineering Co., Newark, N. J.
Emory, Robert J., Co., Newark, N. J.
Entwistle, Jas. L. Co., Pawtucket, R. I.
National Mach'y Exch. (Used), New York, N.Y.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Steel Equipment Co., Cleveland, Ohio.
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.
Wean Equipment Corp., Cleveland, Ohio.
Wire & Textile Mach'y, Inc., Pawtucket, R. I.

MACHINERY—Spring Making
National Mach'y Exch. (Used), New York, N.Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Wells, Frank L., Co., Kenosha, Wisc.

MACHINERY—Staple
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Straightening
Ajax Manufacturing Co., Cleveland, Ohio.
Hallden Machine Co., The, Thomaston, Conn.
Lewis Machine Co., The, Cleveland, Ohio.
Mettler Machine Tool Co., New Haven, Conn.
National Mach'y Exch. (Used), New York, N.Y.
Nilson, A. H. Machine Co., Bridgeport, Conn.
Ruesch, H. J., Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Wean Equipment Corp., Cleveland, Ohio.
Wells, Frank L., Co., Kenosha, Wisc.

MACHINERY—Stranding
Hughesville Machine & Tool Co., Hughesville, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Strip Forming
Wickman, A. C., Ltd., Coventry, England.

MACHINERY—Strip Steel
Aetna-Standard Engineering Co., Youngstown, Ohio.
Fenn Manufacturing Co., Hartford, Conn.
Ruesch, H. J., Machine Co., Newark, N. J.
Steel Equipment Co., Cleveland, Ohio.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Swaging
Fenn Manufacturing Co., Hartford, Conn.
National Erie Corp., Erie, Pa.
National Mach'y Exch. (Used), New York, N.Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Taping
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

WHERE TO BUY, Continued

MACHINERY—Testing Physical
Scott Testers, Inc., Providence, R. I.

MACHINERY—Testing Equipment—Sparkers
Davis, R. L. Elec. Co., Wallingford, Conn.
Entwistle, Jas, L., Pawtucket, R. I.
Wire & Textile Machinery, Inc., Pawtucket, R.I.

MACHINERY—Tinning Wire
American Insulating Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Steel Equipment Co., Cleveland, Ohio.
Syncro Machine Co., Perth Amboy, N. J.
Wean Equipment Co., Cleveland, Ohio.

MACHINERY—Tinsel Rolling Mills
American Insulating Mach'y Co., Phila., Pa.
Fenn Manufacturing Co., Hartford, Conn.
Syncro Machine Co., Perth Amboy, N. J.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Trolley Wire
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Tube Mill
Marshall-Richards Machine Company, Ltd., Trenton, N. J.

MACHINERY—Weaving Wire Cloth
Bruckner-Mitchell, Inc., New York, N. Y.

MACHINERY—Welding Wire
Eisler Engineering Co., Newark, N. J.
Micro Products Co., Chicago, Ill.
Syncro Machine Co., Perth Amboy, N. J.

MACHINERY—Winding
American Insulating Mach'y Co., Phila., Pa.
Bruckner-Mitchell, Inc., New York, N. Y.
Davis, R. L. Electric Co., Wallingford, Conn.
Eisler Engineering Co., Newark, N. J.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wind-up (Constant Tension, Variable Speed)
Aetna-Standard Engineering Co., Youngstown, Ohio.
Davis, R. L. Electric Co., Wallingford, Conn.
Fenn Manufacturing Co., Hartford, Conn.
Industrial Ovens, Inc., Cleveland, Ohio.
Marshall-Richards Machine Company, Ltd., Trenton, N. J.
Standard Machinery Co., Mystic, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wire Bending
Eisler Engineering Co., Newark, N. J.
Kilmer, M. D., & Co., Cleveland, Ohio.

MACHINERY—Wire Drawing
Aetna-Standard Engineering Co., Youngstown, Ohio.
Ajax Manufacturing Co., Cleveland, Ohio.
American Insulating Mach'y Co., Phila., Pa.
Fenn Manufacturing Co., Hartford, Conn.
Marshall-Richards Machine Company, Ltd., Trenton, N. J.
Morgan Construction Co., Worcester, Mass.
National Mach'y Exch. (Used), New York, N.Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Scudder, E. J., Fdry & Mach. Co., Trenton, N.J.
Sleeper & Hartley, Inc., Worcester, Mass.
Steel Equipment Co., Cleveland, Ohio.
Svenska Telegrambyran (Morgardshammer) Stockholm, Sweden
Syncro Machine Co., Perth Amboy, N. J.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn.
Wean Equipment Corp., Cleveland, Ohio.

MACHINERY—Wire Forming
Fenn Manufacturing Co., Hartford, Conn.
Kilmer, M. D. & Co., Cleveland, Ohio.
National Mach'y Exch. (Used), New York, N.Y.
Nilson Machine Co., A. H., Bridgeport, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Wickman, A. C., Ltd., Coventry, England.

MACHINERY—Wire Rope
New England Butt Co., Providence, R. I.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wood Screw
National Mach'y Exch. (Used), New York, N.Y.

MACHINERY—Wrapping Straight Lengths and Tubing
Angier Corporation, The, Framingham, Mass.
Terkelsen Machine Co., Boston, Mass.

MACHINERY—Wrapping Wire Coils
Angier Corporation, The, Framingham, Mass.
Terkelsen Machine Co., Boston, Mass.

MATERIAL HANDLING EQUIPMENT
Cleveland Tramrail Div. of The Cleveland Crane & Engineering Co., Wickliffe, O.

MILLS—Tandem, Rolling & Edging
Torrington Mfg. Co., Torrington, Conn.
Wean Equipment Co., Cleveland, Ohio.

NAILS—Wire
American Steel & Wire Co., Cleveland, Chicago, New York.
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Co., San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.
Roebling, John A. Sons Co., Trenton, N. J.
U. S. Steel Export Co., New York, N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire-Spencer Steel Division of Colorado Fuel & Iron Corp., Buffalo, N. Y.

OVENS—Cable Lacquering
American Insulating Mach'y Co., Phila., Pa.
Industrial Ovens, Inc., Cleveland, Ohio.
Michigan Oven Co., Detroit, Mich.
Morrison Eng'g Corp., Cleveland, Ohio.

OVENS—Dehydrogenizing
Carl-Mayer Corp., The, Cleveland, Ohio.
Industrial Ovens, Inc., Cleveland, Ohio.

OVENS—Industrial
Carl-Mayer Corp., The, Cleveland, Ohio.
Drying Systems, Inc., Chicago, Ill.
Industrial Ovens, Inc., Cleveland, Ohio.
Michigan Oven Co., Detroit, Mich.
Morrison Eng'g Corp., Cleveland, Ohio.
Ross, J. O., Engr. Corp., New York, N. Y.

OVENS—Rod Bakers
Michigan Oven Co., Detroit, Mich.
Morrison Eng'g Corp., Cleveland, Ohio.

OVENS—Welding Rod Coating
Carl-Mayer Corp., The, Cleveland, Ohio.
Drying Systems, Inc., Chicago, Ill.
Industrial Ovens, Inc., Cleveland, Ohio.
Morrison Eng'g Corp., Cleveland, Ohio.
Ross, J. O., Engr. Corp., New York, N. Y.

PAINTS—Heat Resisting
American Chemical Paint Co., Ambler, Pa.

PANS—Vulcanizing
Mossberg Pressed Steel Corp., Attleboro, Mass.

PAPER—Creped Wrapping
Angier Corporation, The, Framingham, Mass.
Crepe-Kraft Company, The, Division National Waterproof Papers, Inc., Newark, N. J.
Terkelsen Machine Co., Boston, Mass.

PAPER—For Coil Wrapping and Corrosion Prevention
Angier Corporation, The, Framingham, Mass.
Crepe-Kraft Company, The, Division National Waterproof Papers, Inc., Newark, N. J.
Terkelsen Machine Co., Boston, Mass.

PATENT ATTORNEYS—
Lancaster, Allwine & Rommel, Washington, D.C.

PICKLING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
Apex Alkali Products Co., Philadelphia, Pa.
Oakite Products, Inc., New York, N. Y.
Parkin Chemical Co., The, Pittsburgh, Pa.

PICKLING—Hooks, etc. Acid Resisting
Lewis Welding & Eng'g Corp., Bedford, Ohio.
Rolock, Inc., Fairfield, Conn.
Youngstown Welding & Engineering Co., Youngstown, Ohio.

PICKLING TANK LININGS—
Chemsteel Construction Co., Pittsburgh, Pa.
Haveg Corp., Newark, Del.
Heil Process Equipment Corp., Cleveland, Ohio.

PLASTIC TESTERS—
Scott Testers, Inc., Providence, R. I.

PNEUMATIC CYLINDERS—
Entwistle, James L. Co., Pawtucket, R. I.

POTS—Lacquer
Industrial Ovens, Inc., Cleveland, Ohio.

POTS—Lead Melting
Robertson, John, Co., Brooklyn, N. Y.

PRESSES—Hydraulic and Mechanical
Robertson, John, Co., Brooklyn, N. Y.
Standard Machinery Co., Mystic, Conn.

PRESSES—Lead
Robertson, John, Co., Brooklyn, N. Y.

PULLERS AND GRIPS—For Wire
Morgan Construction Co., Worcester, Mass.
Scudder, E. J. Fdry & Mach. Co., Trenton, N.J.
Sjogren Tool and Machine Co., Auburn, Mass.
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Wean Equipment Corp., Cleveland, Ohio.

PUMPS—Hydraulic
Robertson, John, Co., Brooklyn, N. Y.

REEL AND TENSION STANDS—
Davis, R. L. Electric Co., Wallingford, Conn.
Entwistle, James L., Co., Pawtucket, R. I.
Industrial Ovens, Inc., Cleveland, Ohio.
Roll-a-Reel, Cincinnati, Ohio.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Perth Amboy, N. J.
Watson Machine Co., Paterson, N. J.

REEL CRUTCHES—
Roll-a-Reel, Cincinnati, Ohio
Watson Machine Co., Paterson, N. J.

REELS & SPOOLS—Drawn Aluminum Alloy
Acrometal Products, Inc., Minneapolis, Minn.
Hubbard Spool Co., Chicago, Ill.

REELS & SPOOLS—Annealing and Stranding
Acrometal Products, Inc., Minneapolis, Minn.
American Pulley Company, Philadelphia, Pa.
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Co., Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp. Niles, Ohio.

REELS & SPOOLS—Collapsible
Entwistle, Jas. L. Co., Pawtucket, R. I.

REELS & SPOOLS—Plastic
Hubbard Spool Co., Chicago, Ill.

REELS & SPOOLS—Steel
American Pulley Company, Philadelphia, Pa.
Apco Mossberg Co., Attleboro, Mass.
Clark, J. L., Mfg. Co., Rockford, Ill.
Hubbard Spool Co., Chicago, Ill.
Mason Can Company, Providence, R. I.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

REELS AND SPOOLS—Shipping and Shop
Acrometal Products, Inc., Minneapolis, Minn.
American Pulley Company, Philadelphia, Pa.
Apco Mossberg Co., Attleboro, Mass.
Bridge Mfg. Co., The, Hazardville, Conn.
Clark, J. L., Mfg., Co., Rockford, Ill.
Hubbard Spool Co., Chicago, Ill.
Mason Can Company, Providence, R. I.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.
North Anson Reel Co., North Anson, Maine.

REELS & SPOOLS—Wooden
Acrometal Products, Inc., Minneapolis, Minn.
American Woodworking Co., Chicago, Ill.
Bridge Mfg. Co., Inc., The, Hazardville, Conn.
Durkee Mfg. Co., Pine River, Minn.
North Anson Reel Co., North Anson, Maine.

REELS—Metal Bound
Durkee Mfg. Co., Pine River, Minn.
Hubbard Spool Co., Chicago, Ill.
North Anson Reel Co., North Anson, Maine.

REELS—Takeoff
Acrometal Products, Inc., Minneapolis, Minn.
American Pulley Company, Philadelphia, Pa.
Apco Mossberg Co., Attleboro, Mass.
Bridge Mfg. Co., The, Hazardville, Conn.
Clark, J. L. Mfg. Co., Rockford, Ill.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.
North Anson Reel Co., North Anson, Maine.

REELS—Vulcanizing & Impregnating
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

REELS—Wire Drawing
Acrometal Products, Inc., Minneapolis, Minn.
American Pulley Company, Philadelphia, Pa.
Apco Mossberg Co., Attleboro, Mass.
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

REELS—Wire Mill
Acrometal Products, Inc., Minneapolis, Minn.
American Pulley Company, Philadelphia, Pa.
Apco Mossberg Co., Attleboro, Mass.
Bridge Mfg., Co., The, Hazardville, Conn.
Durkee Mfg. Co., Pine River, Minn.

WHERE TO BUY, Continued

Hubbard Spool Company, Chicago, Ill.
Mason Can Company, Providence, R. I.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.
North Anson Reel Co., North Anson, Maine.

REFRACTORIES—High Temperature
Norton Company, Worcester, Mass.

RESISTANCE HEATING—Annealing Patenting, Etc.
Trauwood Engr. Co., Cleveland, Ohio.

ROD BAKERS—
Carl-Mayer Corp., The, Cleveland, Ohio.
Drying Systems, Inc., Chicago, Ill.
Rockwell W. S., Co., Fairfield, Conn.
Ross, J. O., Engineering Corp., New York, N.Y.

RODS—Aluminum
Aluminum Co. of America, Pittsburgh, Pa.

RODS—Nickel Alloy
International Nickel Co., Inc., New York, N.Y.

RODS—Stainless Steel
American Steel & Wire Co., Cleveland, Ohio.

RODS—Wire—Non-Ferrous
American Brass Co., The, Waterbury, Conn.
Hudson Wire Co., Ossining, N. Y.
Platt Bros. & Co., The, Waterbury, Conn.

RODS—Wire, Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Indiana.
Keystone Steel & Wire Co., Peoria, Ill.
Roebling's John A., Sons Co., Trenton, N. J.
Youngstown Sheet & Tube Co., Youngstown, O.

ROPE—Wire
American Steel & Wire Company, Cleveland, Chicago, New York.
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Co., San Francisco, Calif.
Roebling's John A., Sons Co., Trenton, N. J.
U. S. Steel Export Co., New York, N. Y.
Wickwire-Spencer Steel Division of Colorado Fuel & Iron Corp., Buffalo, N. Y.

RUBBER AND RUBBER COMPRESSION TESTERS—
Scott Testers, Inc., Providence, R. I.

RUST PROOF COMPOUNDS—
(See Compounds—Rust Preventing)

RUST REMOVING COMPOUNDS—
(See Compounds—Rust Preventing)

SALTS—Heat Treating, Descaling, etc.
Holden, A. F., Company, The, New Haven, Conn. and Detroit, Mich.

SATURATION SYSTEMS—
Industrial Ovens, Inc., Cleveland, Ohio.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y Inc., Pawtucket, R. I.

SOAPS—Industrial and Wire Drawing
Apex Alkali Products Co., Philadelphia, Pa.
Bick, Hans C., Inc., Reading, Pa.
Fiske Brothers Refining Co., Newark, N. J.
Magnus Chemical Co., Garwood, N. J.
Miller, R. H. Co., Inc., Homer, N. Y.
Potter, Neil Co., Newark, N. J.
Standard Industrial Compounds Co., Inc., Chicago, Ill.
Swift & Company, Chicago, Ill.

SOLVENT RESIN SYSTEMS—Experimental
Industrial Ovens, Inc., Cleveland, Ohio.

STAMPINGS—Steel
Hubbard Spool Company, Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.

STRIP—Steel
Armco Steel Corp., The, Middletown, Ohio.
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Roebling's, John A., Sons Co., Trenton, N. J.
Seneca Wire & Mfg. Co., Fostoria, Ohio.
Youngstown Sheet & Tube Co., Youngstown, O.

SWIFTS—Take-off
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Watson Machine Co., Paterson, N. J.

TANKS—Compound
Haveg Corp., Newark, Del.
Watson Machine Co., Paterson, N. J.

TANKS—Pickling
Chemsteel Construction Co., Pittsburgh, Pa.
Haveg Corp., Newark, Del.

TANKS—Steel
Chemsteel Construction Co., Pittsburgh, Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.

TINSEL—Cords, Decorative
(See: Tinsel—Electric Conductor)

TINSEL—Electric Conductor
Hudson Wire Co., Ossining, N. Y.
Montgomery Co., The, Windsor Locks, Conn.
No. American Philips Co., Inc., N. Y., N. Y.

TINSEL—Electric Resistance
(See: Tinsel—Electric Conductor)

TINSEL—Lame, Silver and False Gold
(See: Tinsel—Electric Conductor)

TINSEL—Thread, Silver and False Gold
(See: Tinsel—Electric Conductor)

TINSEL—Thread, Decorative
(See: Tinsel—Electric Conductor)

TINSEL—Wire
(See: Tinsel—Electric Conductor)

TRAMRAIL SYSTEMS—
Cleveland Tramrail Div. of the Cleveland Crane & Engineering Co., Wickliffe, O.

TRAVERSES—For Reels
Entwistle, James L. Co., Pawtucket, R. I.
Hubbard Spool Company, Chicago, Ill.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.

TRAVERSE MECHANISMS—
Apco Mossberg Co., Attleboro, Mass.
Fenn Manufacturing Company, Hartford, Conn.
Mossberg Pressed Steel Corp., Attleboro, Mass.
New England Butt Co., Providence, R. I.
Niles Steel Products Div., Republic Steel Corp., Niles, Ohio.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y Inc., Pawtucket, R. I.

TUBE BENDERS AND FORMERS—
H. D. Kilmer Co., Cleveland, Ohio.
Ruesch, H. J., Machine Co., Newark, N. J.

TURKS HEADS—
Fenn Manufacturing Co., Hartford, Conn.

VALVES & FITTINGS—Acid Resistant
Haveg Corp., Newark, Del.

VARNISHES—For Insulation
Standard Varnish Works, Staten Island, N. Y.

VULCANIZERS—
Watson Machine Co., Paterson, N. J.

VULCANIZING PANS—
American Insulating Mach'y Co., Phila., Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.

WEAVING—Industrial Wire Cloth
Bruckner-Mitchell, Inc., New York, N. Y.

WELDERS—Spot and Butt
Eisler Engineering Co., Newark, N. J.
Micro Products Co., Chicago, Ill.

WIND-UP AND UNWIND SYSTEMS—Continuous
American Insulating Mach'y Co., Phila., Pa.
Davis R. L. Electric Co., Wallingford, Conn.
Entwistle, James L., Co., Pawtucket, R. I.
Industrial Ovens, Inc., Cleveland, Ohio.
Watson Machine Co., Paterson, N. J.
Wire & Textile Mach'y, Inc., Pawtucket, R. I.

WIRE—Aluminum
Aluminum Co. of America, Pittsburgh, Pa.
Malin & Co., Cleveland, Ohio.

WIRE—Barbed
Interlocking Fence Co., Morton, Ill.

WIRE—Cast
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Cold Heading
American Steel & Wire Co., Cleveland-Chicago, New York.
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Co., San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Keystone Steel & Wire Co., Peoria, Ill.
Roebling's, John A., Sons Co., Trenton, N. J.
Timmerbiel, E., Greenwich, Conn.
U. S. Steel Export Co., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Electric
American Brass Co., The, Waterbury, Conn.
Hudson Wire Co., Ossining, N. Y.
Malin & Co., Cleveland, Ohio.

WIRE—Flat, Fine
Montgomery Co., The, Windsor Locks, Conn.

WIRE—Manufacturers
American Steel & Wire Co., Cleveland-Chicago, New York.
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Co., San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Keystone Steel & Wire Co., Peoria, Ill.
Roebling's, John A., Sons Co., Trenton, N. J.
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.
Timmerbiel, E., Greenwich, Conn.
U. S. Steel Export Co., New York, N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire-Spencer Steel Division of Colorado Fuel & Iron Corp., Buffalo, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Molybdenum
North American Philips Co., Inc., New York, N. Y.

WIRE—Music
American Brass Co., The, Waterbury, Conn.
American Steel & Wire Co., Cleveland-Chicago, New York.
Columbia Steel Co., San Francisco, Calif.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Malin & Co., Cleveland, Ohio.
Timmerbiel, E., Greenwich, Conn.
U. S. Steel Export Co., New York, N. Y.
Webb Wire Works, The, New Brunswick, N. J.

WIRE—Nickel & Nickel Alloy
International Nickel Co., Inc., New York, N. Y.

WIRE—Nickel Silver and Phosphor Bronze
American Brass Co., The, Waterbury, Conn.
Hudson Wire Co., Ossining, N. Y.
Malin & Co., Cleveland, Ohio.

WIRE—Non-Ferrous to Specifications for Special Purposes
American Brass Co., The, Waterbury, Conn.
Hudson Wire Co., Ossining, N. Y.
No. American Philips Co., Inc., N. Y., N. Y.

WIRE—Spring
American Brass Co., The, Waterbury, Conn.
American Steel & Wire Co., Cleveland-Chicago, New York.
Bethlehem Steel Co., Bethlehem, Pa.
Columbia Steel Co., San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Keystone Steel & Wire Co., Peoria, Ill.
Timmerbiel, E., Greenwich, Conn.
U. S. Steel Export Co., New York, N. Y.
Webb Wire Works, The, New Brunswick, N. J.
Wickwire-Spencer Steel Division of Colorado Fuel & Iron Corp., Buffalo, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Stainless Steel
American Steel & Wire Co., Cleveland-Chicago, New York.
Columbia Steel Co., San Francisco, Calif.
Firth Sterling Steel & Carbide Co., McKeesport, Pa.
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.
U. S. Steel Export Co., New York, N. Y.
Webb Wire Works, The, New Brunswick, N. J.

WIRE—Steel—Also Coppered Steel—Also Galvanized Steel
Bethlehem Steel Co., Bethlehem, Pa.
Continental Steel Corp., Kokomo, Ind.
Johnson Steel & Wire Co., Inc., Worcester, Mass.
Keystone Steel & Wire Co., Peoria, Ill.
Timmerbiel, E., Greenwich, Conn.
U. S. Steel Export Co., New York, N. Y.
Wickwire Brothers, Inc., Cortland, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

WIRE—Straightening and Cutting
Pittsburgh Cut Wire Co., Pittsburgh, Pa.
Wickwire Brothers, Inc., Cortland, N. Y.

WIRE—Tungsten
North American Philips Co., Inc., New York, N. Y.

WIRE—Zinc
Platt Bros. & Co., The, Waterbury, Conn.

WIRE CLOTH—Industrial
Roebling's, John A., Sons Co., Trenton, N. J.
Wickwire Brothers, Inc., Cortland, N. Y.
Wickwire-Spencer Steel Division of Colorado Fuel & Iron Corp., Buffalo, N. Y.

WIRE WEAVING—Non-Ferrous
American Brass Co., The, Waterbury, Conn.
Hudson Wire Co., Ossining, N. Y.

WRAPPING PAPER—Creped
Angier Corporation, The, Framingham, Mass.
Crepe-Kraft Company, The, Division National Waterproof Papers, Inc., Newark, N. J.

YARNS & TAPES—
Belding, Heminway, Corticelli Co., New York, N. Y.
Glass Fibers Inc., Cleveland, Ohio.
Owens Corning Fiberglas Corp., Toledo, Ohio.
Twitchell, E. W., Philadelphia, Pa.

YARN TESTERS—
Scott Testers, Inc., Providence, R. I.

The WATSON MACHINE COMPANY

ESTABLISHED 1845

PATERSON 3, NEW JERSEY, U. S. A.

WATSON

ELECTRICAL WIRE AND CABLE, WIRE ROPE AND CORDAGE MACHINERY

CONTINUOUS TAKEUPS — TYPE "DC"

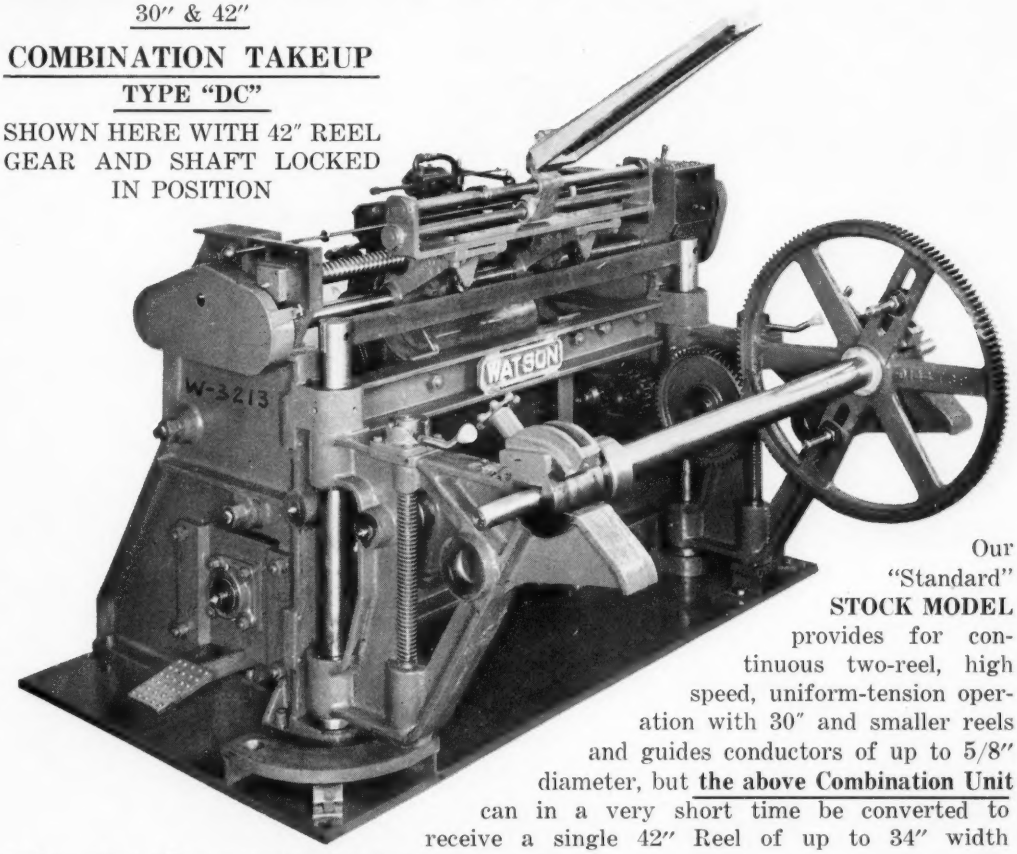
Aside from performance, which is well and widely known, one of the **outstanding advantages** of our "DC" Takeups is that they can be readily adapted to meet a variety of requirements of which the unit shown here is an example:—

30″ & 42″

COMBINATION TAKEUP

TYPE "DC"

SHOWN HERE WITH 42″ REEL GEAR AND SHAFT LOCKED IN POSITION



Our "Standard" **STOCK MODEL** provides for continuous two-reel, high speed, uniform-tension operation with 30″ and smaller reels and guides conductors of up to 5/8″ diameter, but **the above Combination Unit** can in a very short time be converted to receive a single 42″ Reel of up to 34″ width and to effect this conversion it is but necessary to:—

1. — Remove both small reel spindles.
2. — Lock Traverse Guide in central position.
3. — Insert Reel Gear Shaft in 42″ Reel Cylinder Locks.

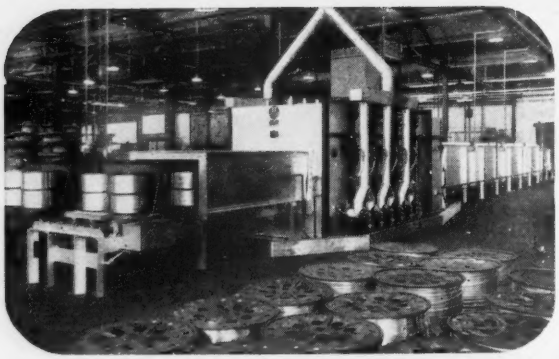
Thus converted, the traverse lay range rises automatically and the Takeup becomes suitable for the uniform-tension winding of conductors up to 1″ diameter.

APPLICATIONS.

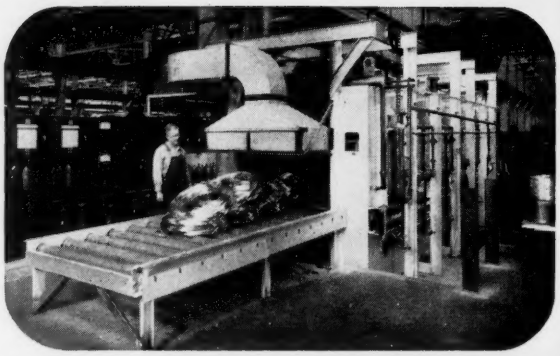
This Combination Unit is most generally supplied in connection with extrusion processes where variety is the rule and the equipment must provide for a wide range i. e. small diameter high-speed and large diameter low-speed runs. Also used in Saturating and other "continuous or long-run" processes and serves as a single takeup in other fields where a uniform light product tension is desirable.

36″ Continuous Takeups also available **Prospective users please request machine bulletin**

Deliveries Usually From Stock

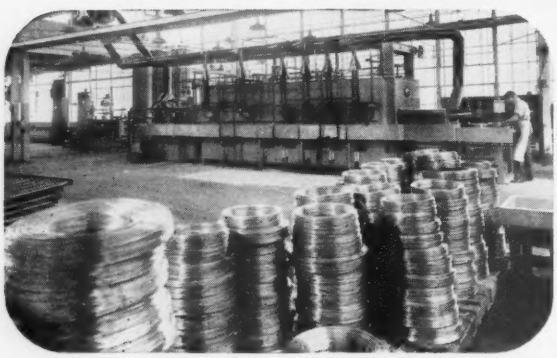


These combination electric and gas fired radiant tube bulkhead tray type furnaces are used extensively for bright annealing wire on reels and in coils.

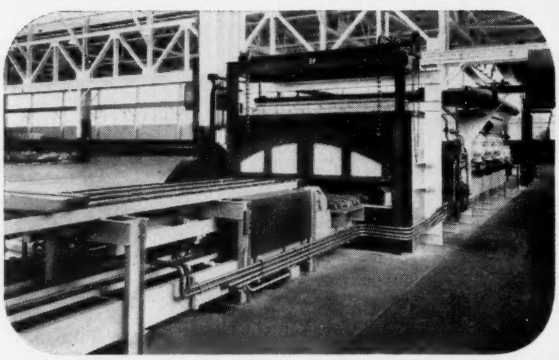


An EF gas-fired three-chamber roller hearth with forced circulating system providing accurate temperature distribution, uniform finish and anneal—continuously.

INVESTIGATE EF DEVELOPMENTS



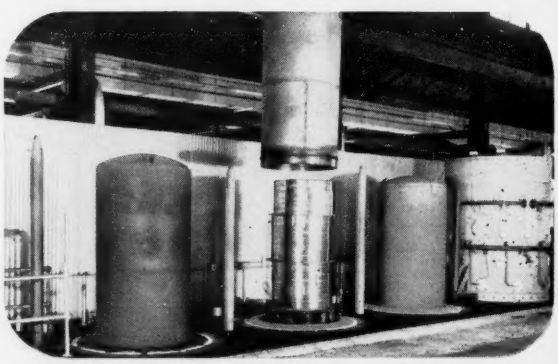
Clean annealing nickel-silver and other alloy wire in an EF gas fired radiant tube continuous roller hearth furnace. Handles coils up to 30" in diameter.



Wire bars up to 66" in length are uniformly and scale-free heated for rolling in this EF gas fired continuous pusher type furnace. Capacity 12,000 lbs. per hour.

FOR EVERY Annealing, Heating or Heat Treating PROCESS

• We have made outstanding production installations for normalizing rod and bright annealing wire in coils, strands, on reels and spools; both ferrous and non-ferrous, including stainless — for heat treating bolts, springs and other wire products—for heating billets, wire bars, bluing and other heating and heat treating processes. We solicit your furnace inquiries.



EF gas fired and electric hood, pit and other batch and continuous type furnaces are available for normalizing rod, annealing wire, strip and other processes.

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GAS FIRED, OIL FIRED AND ELECTRIC FURNACES
FOR ANY PROCESS, PRODUCT OR PRODUCTION

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